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ABSTRACT

This publication describes in detail an objective-referenced program cost model for educational management that was developed by the Maryland State Department of Education. Primary purpose of the publication is to aid educational decision-makers in developing and refining their own method of cost-pricing educational programs for use in state and local accountability efforts. Individual chapters focus in turn on the educational and political context surrounding the development of Maryland's model, the use of a blueprint of Maryland's objective-referenced cost model, adaptation of the Maryland model at the state level, adaptation of the Maryland model at the local level, and adaptation of the Maryland model at the school building level. (JG)

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COOPERATIVE ACCOUNTABILITY PROJECT

THE COST OF BEING ACCOUNTABLE

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An Objective-Referenced Program Cost Model For Educational Management-
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FOREWORD

Rising public and legislative interest in both the cost and effectiveness of public education is one of the most pressing issues in education today. This interest often is expressed in terms of educational accountability. More and more school officials have asked, "Accountability at what cost?" "Which educational accountability components are most important to analyze?" or "What systems model can be installed at State, local, and individual school levels that would adequately cost educational programs?"

The Maryland State Department of Education is pleased to have participated with the Cooperative Accountability Project (CAP) in both an exploratory study of the cost of educational accountability components and this objective-referenced program cost model for educational management within the framework of the Maryland public schools.

In the model, educational programs at State, local, and individual school levels are viewed in terms of their educational objectives. Objectives become the proper level for determining effectiveness and collecting costs of educational programs. An activity and task level provides added structure for stated objectives. These three levels, when placed within a finance and accounting structure comprise a management model capable of yielding educational program costs. As a model, it can help administrators answer several key questions that are at the heart of any workable accountability system, namely, Who is accountable? to whom? under what condition? to what degree? and, at what cost?

Like other models, however, it should be viewed as one attempt among others to put a so-called "handle" on the complex problem of attaching costs to educational programs within a statewide educational accountability system. It is our hope that other state and local educational agencies can profit from this attempt to meet the needs of their own school structures. Perhaps other collaborative efforts can emerge from this Maryland perspective.

We sincerely appreciate the contributions of Maryland State and local school officials and officials from fifteen cooperating states who helped in the refinement of this model.

JAMES A. SENSENBAUGH
State Superintendent of Schools

COMMENTS FROM CAP

In light of the fact that the term "accountability" did not appear in *Education Index* until mid-1970, it is apparent that the many factors involved in implementing educational accountability programs, including cost-pricing, have had to be based on new experiences and new insights.

The principle of cost accounting and the allocation of financial and other resources for the achievement of specific outcomes is inherent in the accountability concept. If merit is derived from relating general school expenditures to benefits, it follows logically that a parallel effort should be made to determine the costs associated with the analysis of those benefits by means of an accountability system. It is unrealistic to concentrate on the various components of accountability--goals and objectives, roles, assessment and evaluation, program budgeting, reportage, and others--without determining the costs inherent in activating these various components.

The costs of accountability comprise a major issue. The price of the effort necessarily concerns state legislatures, boards of education, school administrators, and the general public. To provide all involved individuals and groups with valid information, a realistic method for determining accountability costs must be devised.

In 1972, the Maryland State Department of Education agreed to conduct several studies relating to cost-pricing the components of a comprehensive educational accountability system. An initial report, *Costs of Educational Accountability: A Maryland Exploratory Study*, was published in 1974 by the Cooperative Accountability Project (CAP). Maryland followed its exploration with the establishment of a cost model based upon an objective-referenced accountability program for the state, placing the components of accountability within the context of a financial and accounting structure. Details of the process are presented in this monograph which should assist the reader in developing a cost-pricing methodology suitable to other state and local accountability efforts.

CAP is pleased to publish this second Maryland study and is indebted to the authors for the careful preparation of this timely publication.

Arthur R. Olson, Director
Cooperative Accountability Project

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CHAPTER I

INTRODUCTION

Experienced state and local administrators and finance officers faced with financial restraints and a demand for fiscal accountability may ask:

- What is a comprehensive educational accountability system?
- How much will it cost to implement this system?
- What are the various components of such systems?
- How much will each of those components cost?
- What methods could be used to foster greater management sophistication in education?
- What results can be achieved in terms of meeting policy objectives within the limits of available resources?

School administrators realize that wastefulness exists in educational programs which have outlived their usefulness, in programs that make no vital impact on their students, and in programs that leap from one costly abortive experiment to another. Experience has taught them that increased appropriations in and of themselves do not always yield increased results. Consequently, school administrators are looking for improved management methods to aid them in their decision-making activities. In this cost model, accountability is examined in the framework of management and cost system analysis.

This publication is intended to assist decision makers in refining their own method of cost-pricing educational programs for accountability purposes at different school structure levels.

The Cooperative Accountability Project (CAP) and the Maryland State Department of Education (MSDE) recognized the need of state educational agencies to obtain alternate uniform methods for cost-pricing educational programs for accountability. This report develops one such method.

This report was initiated with four objectives:

1. To provide the background information leading to the development of the cost model
2. To highlight the educational cost and management literature

on accountability related to Program Planning Budgeting (PPBS), Management by Objectives (MBO), Management Information Systems (MIS), and Uniform Accounting Procedures (UAP)

3. To provide the framework of a uniform educational accountability cost model based upon principles and concepts in program management, management by objectives, and program planning and budgeting

4. To adapt the objective-referenced program cost model for educational management to state and local and school program settings

CHAPTER II

DESCRIBING THE CONTEXT:

BACKGROUND TO THE REPORT

Chapter Objectives

- To identify the major points of the Educational Accountability Act, Article 77, Section 28A of the Annotated Code of Maryland
- To define Maryland Educational Accountability
- To describe the Maryland State Plan for Implementation of Accountability
- To identify the Maryland statewide goals in reading, writing, and mathematics
- To discuss the norm-referenced instruments currently used in the statewide assessment program
- To describe the assessed component of the Maryland Educational Accountability program
- To identify Maryland's role in the Cooperative Accountability Project

A series of events led to the authorization and construction of this objective-referenced program cost model for educational management publication by the Maryland State Department of Education and the Cooperative Accountability Project. This chapter will help the reader understand the publication within the context of educational accountability in the State of Maryland since 1972.

Maryland Educational Accountability Act

Article 77, Section 28A, the Educational Accountability Act provides the impetus for educational accountability in the State of Maryland. The Act is reprinted in Figure 2.1.

Figure 2.1

Article 77, S. 28A, reproduced below, was passed in the 1972 legislative session of the Maryland State Legislature. The bill provides for a program of educational accountability for the public schools of Maryland. Members of the State Department of Education worked with legislators on this bill. Although the bill was to take effect July 1, 1972, funding was not provided until July 1, 1973.[1]

ARTICLE 77, SECTION 28A
(Senate Bill No. 166)

The purposes of this Act are to provide for the establishment of educational accountability in the public education system of Maryland, to assure that educational programs operated in the public schools of Maryland lead to the attainment of established objectives for education, to provide information for accurate analysis of the costs associated with public educational programs, and to provide information for an analysis of the differential effectiveness of instructional programs.

(a) Educational accountability program. The State Board of Education and State Superintendent of Schools, each Board of Education and every school system, and every school, shall implement a program of education accountability for the operation and management of the public schools, which shall include the following:

(1) The State Board of Education and the State Superintendent of Schools shall assist each local school board and school system in developing and implementing educational goals and objectives for subject areas including, but not limited to reading, writing and mathematics.

(2) Each school, with the assistance of its local board of education and school system, shall survey the current status of student achievement in reading, language, mathematics, and other areas in order to assess its needs.

---

[1] Article 77, Section 28A of the Annotated Code of Maryland, 1973 Cumulative Supplement.

(3) Each school shall establish, as the basis of its assessment project, goals and objectives which are in keeping with the goals and objectives established by its board of education and the State Board of Education.

(4) Each school, with the assistance of its local board of education, the State Board of Education and the State Superintendent of Schools, shall develop programs for meeting its needs on the basis of priorities which it shall set.

(5) Evaluation programs shall concurrently be developed to determine if the goals and objectives are being met.

(6) Re-evaluation of programs, goals and objectives shall be regularly undertaken.

(b) The State Department of Education shall assist the local board of education in establishing this program by providing guidelines for development and implementation of the program by the local boards, and by providing assistance and coordination where needed and requested by those boards.

(c) Beginning on July 1, 1973, the State Board of Education, upon recommendation of the State Superintendent of Schools, shall include in its annual budget request such funds as it deems necessary to carry out the provisions of this Act.

(d) During January, 1975, and each January thereafter, the State Superintendent of Schools shall transmit to the Governor and to the General Assembly a report which includes, but is not limited to, documentation indicating the progress of the State Department of Education, the local boards of education and each school in the State toward the achievement of their respective goals and objectives and recommendations for legislation which the State Board of Education and the State Superintendent of Schools deem necessary for the improvement of the quality of education in Maryland.

Sec. 2. And be it further enacted that this Act shall take effect July 1, 1972.

Definition of Accountability

In Maryland, educational accountability is viewed as an attempt to determine, explain, and disclose the results achieved by public school programs. Its purpose is to promote an understanding of the relationship between the quality of education and available resources and, on the basis of that understanding, to make educational improvements. From the fiscal standpoint accountability is an accounting for: (1) money received and spent to meet a strict audit of funds, (2) the kinds of objectives, activities, and tasks funds were spent for, and (3) the effectiveness (not in a causal but inferential sense) of the activities in terms of educational purposes.

The State Plan for Implementation of Accountability

The plan for implementing the State's accountability program included a schedule of deadlines for completing the several phases of establishing goals and objectives. The first deadline was August 1, 1973, by which time the Maryland State Board of Education was to have adopted and disseminated broad statewide goals in reading, writing, and mathematics. Other scheduled deadlines were December 1, 1973, for developing and disseminating a catalogue of goals and objectives (by the Maryland State Department of Education) and June 1, 1974, for the establishment and submission of school system goals to the State Coordinator of Accountability, for review by the appropriate state goals committee.

The State implementation plan further specified that by September 1, 1974, school system goals would be reviewed and that by April 1, 1975, each school would have established its own objectives, consistent with its unique needs and in keeping with school system goals. September 1, 1975, was designated as the deadline for school systems to evaluate the objectives submitted by individual schools and to submit a narrative report to the Maryland State Department of Education on the establishment of school objectives.

The State's implementation plan required the establishment of a comprehensive and uniform statewide testing program. The plan also called for the establishment of procedures for collecting data on student, home, community, and school characteristics. The implementation plan required the establishment of procedures by which school systems would report test results and other information to the Maryland State Department of Education.

The State plan specified that the Iowa Tests of Basic Skills (ITBS) and the Cognitive Abilities Test (CAT) would be given, starting in the spring of 1974, to all pupils (excluding certain categories of handicapped students) in grades 3, 5, 7, and 9, except that school systems could elect to sample grades for testing (Frederick County elected to sample). More specifically, the plan designated the dates March 1 to

March 31 for ITBS and CAT testing in grades 7 and 9 and the period from April 15 to May 15 for ITBS and CAT testing in grades 3 and 5. Students in ungraded classes were to be tested on the test level commensurate with their years in school, excluding kindergarten, or on the basis of their birth dates.

Conditions under which tests are given must be uniform if the results are to be valid and reliable. Test results must be reported systematically and consistently. Explicit descriptions of responsibilities at the local school system and school levels were developed to address these requirements. These descriptions and related accountability procedures appear in the Maryland State Department of Education (MSDE) *Maryland Handbook on the Accountability Assessment Program.*[2] By November 1, 1974, according to the accountability implementation plan, the Maryland State Department of Education was to have completed the first summary analysis of all data collected up to that time.

A major assumption underlying Maryland's accountability legislation is that the analysis and interpretation of pertinent test data and other information lead to beneficial changes and modifications in instructional programs. However, it is not sufficient just to assume that the school's instructional programs become more effective and efficient because the State has an assessment program. In keeping with the Maryland Educational Accountability Act, evaluation programs must be developed and installed to determine the effect that modifications of the instructional programs have upon goal attainment. The MSDE is encouraged by the Act to assist local school systems and schools in this evaluation task by sponsoring pilot evaluation projects in selected school systems.

Adequate evaluation of instructional programs requires the use of more than just norm-referenced tests. Criterion-referenced tests in reading, writing, and mathematics must be developed or adapted for use in Maryland's public schools. The State's accountability program must be extended to other subject matter areas and to domains other than the cognitive one. There also is a need to develop effective procedures for establishing the cost of various instructional programs. Efforts are under way to develop cost analysis information which may be included in the accountability report for 1974-1975.

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[2] Maryland State Department of Education, *Maryland Handbook on the Accountability Assessment Program* (Research Triangle Park, North Carolina: Research Triangle Institute, Center for Educational Research and Evaluation, 1974), pp. 5-12.

MSDE Statewide Goals in Reading, Writing, and Mathematics

Chapter 1, Section 1.4 of the *Maryland Accountability Program Report* presents an accurate statement of the subject areas of concentration given priority in accountability. It states:

> In response to the accountability legislation enacted by the Maryland State Legislature and in accord with the six characteristics formulated by the States' Accountability Program, the Maryland State Board of Education determined that the initial efforts of accountability should concentrate on the basic learning skills of reading, writing, and mathematics. The Board resolved that, following the specification of desired educational goals in each of the three areas, student achievement relative to each goal should be measured and then an analysis of achievement results related to other variables, such as student ability and socioeconomic status, should be conducted.[3]

In June 1973, the MSDE published statewide goals in reading, writing, and mathematics for students in public school systems.[4] The goals were generated by the State Advisory Council on Accountability in cooperation with State and local specialists in basic skills areas.

Goals in Reading

> Each Maryland student who has achieved the objectives for reading set by the local school should:
>
> (a) utilize a variety of reading materials
>
> (b) use a word recognition system
>
> (c) comprehend various reading materials
>
> (d) meet the reading demands for functioning in society
>
> (e) select reading as a personal activity

---

[3] Maryland State Department of Education, Division of Research, Evaluation, and Information Systems, *Maryland Accountability Program Report: School Year 1973-1974* (Baltimore: Westat Research, Incorporated, 1975), pp. 3-1 to 3-8.

[4] Ibid., pp. 3-1 to 3-8.

Goals in Writing

Each Maryland student who has achieved the objectives for writing established by the local school should:

(a) use the writing process to communicate personal feelings and ideas, observing accepted conventions of writing

(b) use the writing process to respond to the demands and obligations of society, observing accepted conventions in writing

(c) value writing for personal and social reasons

Goals in Mathematics

Each Maryland student who has achieved the objectives for mathematics established by the local school should:

(a) recall and/or recognize mathematical definitions, facts, and symbols

(b) perform mathematical concepts and processes

(c) understand mathematical concepts and processes

(d) solve specific mathematical problems

(e) use mathematical reasoning and processes to meet personal and social needs

(f) appreciate and use mathematics

The comprehensiveness of the goals precluded total assessment for a status report to the Legislature by January of 1975.

Accountability Assessment Instruments

The Local Coordinators, the Advisory Committee, and the State Board of Education agreed that all systems would administer the Iowa Tests of Basic Skills (ITBS), Form 5, 1971 edition, and the Cognitive Abilities Test (CAT), Form 1, 1971 edition, two tests developed and published by the same company and normed on the same population. Only seven Maryland school systems were not using some edition of the ITBS at the time the tests were selected.

Support for the selection of the ITBS came from the fact that these tests are favorably reviewed in Buros' *The Seventh Mental Measurements Yearbook*[5] and are highly rated with regard to content coverage and statistical characteristics by the University of California, Los Angeles Center for the Study of Evaluation. Also important was the fact that the ITBS can provide criterion-referenced, as well as norm-referenced, information for instructional program analyses, in those instances where the objectives of the school coincide with the objectives being measured by the test items.

While it was acknowledged that the ITBS did not address all areas of all stated goals, the instrument did address portions of some of the adopted State goals. This limitation was emphasized in both the *Maryland Accountability Program Report*[6] and the development of assessment procedures in the subject areas (i.e., reading, mathematics, etc.) of the State educational goals. The expressed intention of the Maryland State Department of Education is to refine the assessment procedure to be more congruent with the adopted State goals by the fifth year of the accountability program.

Implementation and Evaluation of the Assessment Component of the Maryland Accountability Program

From March 1 to May 15, 1974, the Assessment Component of the Maryland Accountability Program was implemented and evaluated.[7] All 24 school systems in the State participated in this testing phase. Major responsibilities for the implementation of the Maryland Accountability Assessment Program (MAAP) guidelines were given to superintendents for each school system, their accountability coordinators, and classroom teachers in third, fifth, seventh, and ninth grades. The results of this assessment component for the state were published in the *Maryland Accountability Program Report: School Year 1973-1974.*[8]

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[5] Oscar K. Buros, *The Seventh Mental Measurement Yearbook* (Highland Park, New Jersey: Gryphon Press, 1972).

[6] op. cit., *Maryland Accountability Program Report: School Year 1973-1974*, p. 1-12.

[7] Maryland State Department of Education, *An Evaluation of the Operations of the Assessment Component of the Maryland Accountability Program: Occasional Paper on Accountability* (Baltimore: Acromat, 1974).

[8] op. cit., *Maryland Accountability Program Report: School Year 1973-1974.*

Maryland's Future in Accountability

Accountability will exist in Maryland when the following conditions have been met: (1) the state goals of education reflect the educational needs and interests of the population: (2) current student status, recent progress, and needed improvement in each goal area are matters of public record, and specific objectives for improving the current status have been adopted; (3) programs to achieve specific objectives have been implemented; and (4) the cost of programs, i.e., the cost of achieving goals and objectives, is a matter of public record.[9]

CAP and The Maryland State Department of Education Costs Efforts

Between 1972 and 1974, the Maryland State Department of Education conducted two efforts for the Cooperative Accountability Project (CAP) which led to the material presented in this monograph: (a) *Cost of Educational Accountability: A Maryland Exploratory Study* and (b) A Maryland Conference on Establishing a Comprehensive Accountability Cost System.

(a) *Cost of Educational Accountability: A Maryland Exploratory Study.*[10] In December, 1972, an agreement was reached between the Maryland State Department of Education and the Colorado Department of Education which called for MSDE to conduct a study of estimated costs of educational components within the accountability system of Maryland. MSDE subcontracted to University of Maryland, College of Education, Bureau of Educational Research and Field Services (BERFS), to complete the school system data on costs of four educational components of accountability identified in the Maryland Educational Accountability Act: (1) Goal Development and Implementation; (2) Objective Development and Implementation; (3) Status Surveying of Student Achievement; and (4) Educational Program Development.[11]

Six major findings of the study were:

- A diverse estimated cost range on each of the four educational components exists across all the Maryland school systems surveyed.

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[9] op. cit., *Maryland Handbook on the Accountability Assessment Program*, pp. 11-12.

[10] Maryland State Department of Education, *Costs of Educational Accountability: A Maryland Exploratory Study* (Denver, Colorado: Cooperative Accountability Project, 1974). Also see the article by Gilbert R. Austin and Stephen P. Holowenzak, "Component Costs of Educational Accountability," *Planning & Changing* (Fall, 1974) 5:3, pp. 167-174.

[11] op. cit., Article 77, Section 28A of the Annotated Code of Maryland, 1973 Cumulative Supplement.

- No consistent formula or mechanism is used across the school system for deriving projected and actual costs associated with educational accountability.

- If any scale economics do, in fact, exist, they occur in school systems with student enrollments over 50,000. The cost estimates for small-(under 10,000 student enrollment) and medium-(10,000 to 50,000 student enrollment) sized school systems appear quite similar.

- The fixed costs involved in the accountability components are high, and therefore the larger school systems are better able to absorb them by distributing them across their large school population.

- For the goal and objective component, the small- and medium-sized school systems incur higher per-pupil costs than do the large-sized systems.

- For the status surveying component, an inverse relationship between per-pupil expenditures and systems size is apparent.

(b) A Maryland Conference on the Development of an Educational Accountability Cost Model. The earlier study provided the impetus for a second effort launched by the Maryland State Department of Education which had a twofold purpose: (1) to determine the parameters for a comprehensive educational accountability cost model, and (2) to determine the feasibility of planning, constructing, and publishing a monograph for state and local educational agencies on the cost finding of educational components of accountability. Individuals with expertise in the areas of program management, research, evaluation, and school finance from the MSDE, local educational agencies, University of Maryland, and U.S. Office of Education were brought together to determine the educational parameters of an accountability cost model.

The parameters of the cost model identified in this conference included the need to: (1) identify the elements of an accountability cost model, (2) delineate a cost coding structure, (3) delineate the significant levels of cost collection, (4) provide a hands-on mechanism for reporting resources and their costs, and (5) develop and install computer capability to accommodate the reporting mechanism. Such parameters formed the basis of a series of papers which focused on a uniform model for determining accountability costs at state and local educational agency and school program levels. These parameters were presented for review and critiqued at the CAP Regional Conferences on Educational Accountability Techniques. Some of these parameters are discussed in detail in later chapters of this report.

Summary

It is the implicit demand of educational accountability that educators determine their accomplishments by assessment procedures. Accomplishments must be matched to input of resources by application of costing techniques. Educational assessment and costing must, in turn, be oriented to objectives of a prescribed comprehensive educational accountability system.

The Maryland experience and its interaction at the national level with CAP have provided insight into the process of gathering necessary information about educational program management cost analysis and program effectiveness by using educational objectives.

Educational accountability in Maryland is more than the mandate of an annual report to the Legislature. It is an educational change factor influencing the management styles of educational administrators so that more sophisticated methods and technologies are brought into the decision-making arena to resolve some of the problems involved in the allocation of scarce resources.

CHAPTER III

THE USE OF SOPHISTICATED MANAGEMENT METHODOLOGY IN EDUCATIONAL PROGRAM COSTING

Chapter Objectives

- To provide a systems approach framework for fiscal educational accountability
- To highlight four major management tools currently being applied to educational accountability by administrators and finance officers
- To describe the management oriented models of PPBS, MIS, MBO, and UAP
- To provide the foundation for a unified method of collecting educational program costs of a comprehensive accountability

A review of the more than 4,000 articles, monographs, and books published on the concept of educational accountability between 1969 and 1975 by Browder (1971, 1973, 1975)[1] and CAP publications shows that (a) no state has completely developed and implemented what might be called a "comprehensive accountability system"; (b) various components of a comprehensive accountability system (e.g., legislation by the states, roles and responsibilities of participants, goal review and development, needs assessment, objective development, educational indicators, assessment and evaluation, and reporting and disclosure) have been studied; (c) a dearth of literature exists in terms of management tools for deriving the costs in a comprehensive educational accountability system.

The demand for accountability is clearly evident in the spiraling experimentation and operationalization of new management appraisal systems in education. The development of Program Planning and Budgeting Systems (PPBS), Management by Objectives (MBO), Management

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[1] Lesley H. Browder, Jr., *Who's Afraid of Educational Accountability: A Representative Review of the Literature* (Denver: Cooperative Accountability Project, 1975). Also, Lesley H. Browder, Jr., *Emerging Patterns of Administrative Accountability* (Berkeley, California: McCutchan Publishing Company, 1971). Lesley H. Browder, Jr., William A. Atkins, and Esin Kaya, *Developing Educationally Accountable Programs* (Berkeley, California: McCutchan Publishing Company, 1973).

Information Systems (MIS), Uniform Accounting Procedures (UAP), and other management supporting techniques at the state, local, and federal levels are significant parts of attempts to alleviate the accountability program cost problem. In this report, PPBS, MBO, MIS, and UAP will be discussed within the framework of the systems approach. The management tools will, in turn, provide the foundation for the objective-referenced program cost model discussed in the following chapter.

Systems: Definition, Structure, and Design

The word "system" is used to communicate many different ideas. Webster cites no less than 15 definitions to this term among which are: a regularly interacting or interdependent group of items forming a unified whole; as . . . an organization forming a network especially for distributing something or serving a common purpose.[2] Banathy (1968)[3] defines the term as "deliberately designed synthetic organisms, comprised of interrelated and interacting components which are employed to function in an integrated fashion to attain predetermined purposes." Sippl (1967)[4] regards the term as "a devised and designed regular or special method, plan, methodology, or procedure: the organization of hardware, software, and people for cooperative operation to complete a set of tasks for desired purposes."

From such definitions one can imply two interpretations: the word "system" connotes both a way of looking at things as well as a technology. As a way of looking at things, for example, the systems concept can aid the public in understanding some reality. As a technology, the technical knowledge supplied in terms of system engineering can aid professionals in many areas in reconstructing some reality.

In this paper, "system" should be thought of as indicating a *process*. In brief, "systems analysis" is an orderly process for (1) defining and describing a universe of interest (and the significant factors and interrelationships within the universe); (2) determining what changes in the universe will cause a desired effect; and (3) identifying a preferred (or optimum) choice among possible alternatives.

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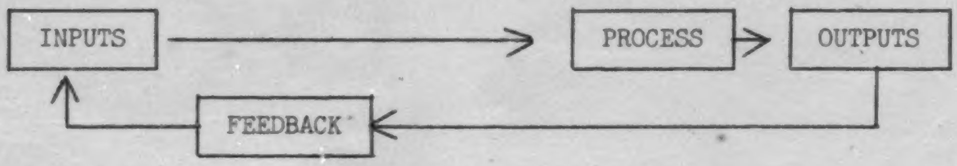
[2] Webster's Seventh New Collegiate Dictionary (Springfield, Massachusetts: G. & C. Merriam Co., 1965), p. 895.

[3] Bela H. Banathy. *Instructional Systems* (Palo Alto, California: Fearon Publishers, 1968), pp. 2-3.

[4] Charles J. Sippl, *Computer Dictionary and Handbook* (Indianapolis, Indiana: Howard W. Sams and Co., Inc., 1967), p. 312.

Frequently, the system process is expressed in terms of a basic systems model containing the elements of inputs (components); process (interaction); outputs (purpose); and feedback (control). Figure 3.1 provides the design and structure of these elements. A group of interdependent elements act together to accomplish a predetermined purpose.

Figure 3.1: The Basic Systems Model



(Although "outputs" or "purpose" appear last in this figure, it must be analyzed first, both to name the system and to specify its objectives.) Figure 3.1 shows that each of the elements is necessary for the completion of the system, with inputs (components) going through some process (interaction) to yield some type of output (products) which, in turn, provides feedback (control) into what is called the "self-renewing cycle of a system." Essentially, systems tend to maintain themselves in a *steady state* or a state of *dynamic equilibrium*. In brief, this means maintaining a balance between and among its parts. The word "dynamic" indicates an ability to change relationships, but the word "equilibrium" indicates a stable tendency. Consequently, it is normal for systems to resist change.[5]

The systems approach and variations of basic systems models have been applied to many areas, including education. In educational program management, there are many reactions to systems concepts, some hostile, some neutral, others enthusiastic (and almost euphoric). One of the positive spin-offs, however, is that it is forcing educators to deal with the nitty-gritty: cost, availability, and usefulness of details in the entire educational enterprise. For example, Van Giech and Hill (1971)[6] applied and expanded the above-mentioned elements into educational program budgeting.

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[5] Walter LeBaron, *Systems Analysis and Learning Systems in the Development of Elementary Teacher Education Models* (Washington, D.C.: Systems Development Corporation, October, 1969), pp. 3-5.

[6] John Van Giech and Richard E. Hill, *Using Systems Analysis to Implement Cost-Effectiveness and Program Budgeting in Education* (Englewood Cliffs, New Jersey: Educational Technology Publication, 1971), pp. 24-26.

These authors include the following elements and descriptions in their design:

(A) Philosophy:	A compound statement based on beliefs, concepts and attitudes from which the educational purpose of the system is derived and perpetuated.
(B) Goals	A statement proposing desired and valued states of being and/or general levels of proficiency to be achieved. Goals are achieved through the accomplishments of objectives within an educational entity.
(C) Objectives:	A quantifiable and/or observable achievement accomplished under specifiable conditions. Objectives should reflect the critical factor required for achievement of a goal.
(D) Inputs and/or Resources Entering the System:	In the school situation, the children to be given an education are "input" to the system within which resources are applied. Manpower (e.g., teachers, non-teaching staff, administrative personnel), talent (e.g., "know-how"), and information can be considered either as resources or inputs to an educational system.
(E) Outputs:	After the student receives an education, the educated child is an "output" of the system. Outputs are called outcomes, benefits, or results. The outputs of one system become the inputs to another as exemplified by the output of the elementary school, which becomes an input to the secondary school.
(F) Environment:	All the systems outside the boundaries of the one under consideration. The environment may be of a physical, social, political, economic, or technological nature.
(G) Programs:	Those processes by which inputs are converted into outputs. Programs can also be broken down into activities, tasks, elements, components, projects.

(H) Measure of Effectiveness:	A designed system must fulfill a need. One, therefore, requires some measure of the extent or the degree to which these needs are being met. The relationship between inputs or resources (costs) and outputs (benefits, effectiveness) is usually embodied as a value model which provides a method of evaluating the efficiency of the system. The value model will then be used to measure the relative worth of alternatives by taking into account their cost-effectiveness and their timeliness or schedule (time dimension).
(I) Feedback:	The process of returning outputs to the system as inputs by means of feedback loops, or, the control mechanism which permits knowledge of results and subsequent adaptation so that purposes are achieved and balance is maintained in the system.

This overview of the basic system model, hopefully, provides the reader with a framework from which he or she can examine the other models presented within our discussion of PPBS, MBO, MIS, and UAP.[7]

Systematic Man-Information Management Models

A number of man-information management models incorporate the basic principles and design of the systems approach to meet the demand of management and fiscal accountability. Under this umbrella fall such methodologies (new to education but already applied to business management techniques) as program planning and budgeting systems, management by objectives, management information systems, and uniform accounting procedures.

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[7] For a sourcebook that should be used by those interested in systems research see: Walter Buckley, *Modern Systems Research for the Behavioral Student* (Chicago: Adline Publishing Company, 1969). Also see Ida R. Hoos, *System Analysis in Public Policy: A Critique* (Berkeley, California: University of California Press, 1974). This book provides the reader with thorough coverage of the system approach from the theoretical and practical perspective in the areas of psychology, sociology, and education. Public administrators will benefit from the book since the author challenges, with critical insight, the systems analysis mystique, methods, and products.

According to Hawthorne (1974),[8] 16 states have legislation concerning one or more of these modern management techniques. (Florida and Ohio have legislation covering all four management tools.) The following sections of this chapter highlight the above systems as they relate to educational accountability.

Program Planning and Budgeting Systems (PPBS) - What It Is

The most popular management tool among school administrators is program planning and budgeting systems (commonly abbreviated as PPBS).[9] Rand Corporation developed the concept as "an integrated system to facilitate planning and decision making." During the late 1960s and the 1970s, the concept became regarded as a means to greater management sophistication in school structures. At the one end of a continuum, the U.S. Office of Education *Handbook II, Revised* regards educationally related PPBS as "a structured procedure for determining policy in the allocation of resources for accomplishment of priority programs, emphasizing long-range planning, analytic evaluations tools, and economic relationship in the setting of goals and objectives and in the determination of programs." At the other end of the continuum, California defines PPBS, from the local school district standpoint, as a "comprehensive management approach that can be used by school districts to improve their effectiveness in providing opportunities for the growth of students, and efficient planning, analyzing, performing, evaluating, and communication with publics.[10] Hawthorne (1974)[11] maintains that under a PPBS, short- and long-term planning, the development of instructional programs and the preparation of school budgets are brought into a single, integrated system.

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[8] Phyllis Hawthorne, *Characteristics of and Proposed Models for State Accountability Legislation* (Madison, Wisconsin: State Education Accountability Repository, 1974).

[9] Stephen J. Knezevich, *Program Budgeting (PPBS): A Resource Allocation Decision System for Education* (Berkeley, California: McCutchan Publishing Corporation, 1973).

[10] *Education Planning and Evaluation Guide for California School Districts* (Sacramento, California: Department of Education, Third Preliminary Edition). (As of February, 1974, not yet adopted by the State Board of Education or Legislature.) Also, Sheila Krystal and Samuel Henrie, *Educational Accountability and Evaluation*. PREP Report No. 35 (Washington, D.C.: U. S. Office of Education, 1972.).

[11] op. cit., *Characteristics of and Proposed Models for State Accountability Legislation*, p. 16.

Johns, Alexander, and Jordan (1972)[12] view PPBS as "an operational applications systems analysis in education." The authors make the following statement on PPBS:

> A PPB system may be viewed as an operational application of systems analysis in education. In general, a PPB system attempts to identify the objectives to be served by educational programs; plan programs which will maximize the accomplishment of these objectives by systematic identification of alternatives and comparison of potential benefits and costs; allocate resources, through the budget process, to the program selected for implementation, and monitor progress toward objectives in the programs that are implemented so that the results of evaluation can be fed back to modify and sharpen the programs.

The literature on PPBS shows this tool to be a program management method oriented to administrative decision-making and containing (1) goals, (2) objectives, (3) a need for a number of prerequisites prior to development and implementation, (4) conceptualized and implemented PPB system models, (5) definite intent, and (6) programs.

PPBS Goals and Objectives

The Committee of Economic Development (1971)[13] describes PPBS as having four principal goals: (1) seeking to introduce classification systems (called "Program structures") that categorize activities by type of objectives to be accomplished (outputs) rather than the type of goods and services that constitute the immediate objects of agency expenditure (inputs); (2) attempting to array under each program category or subcategory all the costs of the entire system of activities associated with a particular output, regardless of organizational structure; (3) trying to orient the program manager not only to the allocation of resources but also to the specific results he is expected to accomplish with them; and (4) seeking to provide the basis for budgetary, accounting, and reporting control. The Committee concludes that all four goals are valuable in presenting a picture of how resources have been allocated and in determining the cost of each kind of output.

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[12] Roe L. Johns, Kern Alexander, and K. Forbis Jordan, *Financing Education: Fiscal and Legal Alternatives* (Columbus, Ohio: Charles E. Merrill Publishing Company, 1972), pp. 71-72.

[13] Committee for Economic Development, *The Management and Financing of Colleges* (New York: Committee for Economic Development, 1973).

Schultze (1968)[14] views the goals of the PPBS within the context of domestic social programs as:

> Careful identification and examination of goals and objectives in each major area of activity; analysis of the output of a given program in terms of its objectives; measurement of total program costs, not for just one year but for at least several years ahead; formulation of objectives and programs extended beyond the single year of the annual budget submission; and analyses of alternatives to find the most effective means of reaching base program objectives and to achieve these objectives for the least cost.

One of the best short descriptions of the nature and objectives of PPBS in state-local finances is provided by Mushkin and Herman (1968):[15]

> Program analysis essentially involves a reduction of complex problems into their component segments so that each can be studied. Questions of fact can thus be subjected to the test of observed experience. Those aspects of the problem that involve value judgments can be separately identified and the basis of judgment made explicit. The analysis of concept is the cost and effectiveness of alternative ways of meeting the problems. The alternatives may be in the form of different programs or different levels of programs or both.

Sisson, Brewin, and Renshaw (1972)[16] regard PPBS as a method for performing two types of analysis in preparation for establishing an annual budget. First, data about the school district and about the world in which the school district exists must be analyzed in order to understand the present status of the district and the nature of the community it serves. Second, various ways in which the school district could operate must be studied, and predictions must be made concerning the influence various possible activities will have on the desired objectives. The purpose of PPBS, they suggest, is to assist the decision-making group in choosing the most desirable changes to be undertaken in the school district--innovations, new projects, changes in resource levels, or reduced programs--so as to close the gap in priority order within acceptable expenditures and reasonable manpower levels.

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[14] C.L. Schultze, *The Politics and Economics of Public Spending* (Washington, D.C.: Brookings Institution, 1968), p. 19.

[15] Selma Mushkin and Brian Herman, *The Search for Alternatives: Program Options in a PPB System, State-Local Finances Project* (Washington, D.C.: The George Washington University, October, 1968), pp. 3-4.

[16] Roger L. Sisson, C. Edwin Brewin, Jr., and Benjamin H. Renshaw, "An Introduction to the Educational-Planning-Programming-Budgeting System." *Educational Technology.* 12-2 (Feburary, 1972), pp. 54-60.

Finally, Hartley (1968)[17] maintains that a PPBS is intended to facilitate the kinds of information and data analysis which furnish administrators with a more complete basis for a rationale. PPBS is designed to foster economic efficiency. Advantages which it offers over traditional practices include (1) program-oriented information; (2) analyses of possible alternative programs and objectives; (3) long-range plans and evaluation criteria; (4) use of contemporary concepts to improve educational personnel competencies; (5) structural flexibility and participatory planning; and (6) reports of school programs in the school budget documents. He points out that successful installation of the program budgeting format is dependent on completion of three kinds of research activities: (1) program classification, structure design, and planning matrices; (2) programming, system analysis, and budgeting; and (3) information support, evaluation, and program revision. The focus on programs allows boards of education, administrators, teachers, and the general public to seek resources for needed programs.

Prerequisite to PPBS

A number of prerequisites to the institution of an overall PPBS are listed by Duncan (1971):[18]

1. An adequate cost-accounting system

2. An adequate personnel system

3. The introduction of comprehensive planning mechanisms at all levels in education

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[17] Harry J. Hartley, "PPBS - Current Research and Programmatic Implications for Collective Negotiations." (Paper presented to the American Educational Research Association, Chicago, February 8-10, 1968.)

[18] Merlin G. Duncan, "An Assessment of Accountability: The State of the Art." *Educational Technology.* 11 (January, 1971), p. 30.

4. An improved "delivery system" harmonizing federal, state, and local goals in delivering quality education

5. Enlightened leadership from educational managers at all levels

6. The ability to research and evaluate ourselves and to eliminate the fear of being wrong

7. A mechanism to eliminate the built-in biases of many teachers and administrators

8. Drastic changes in the training programs for educational administrators, to include the following:

    (a) Financial management and accounting

    (b) Theory of organizations

    (c) State, local, and federal government

    (d) School law (more than the usual)

    (e) Clinical internships for at least nine months, with residenced credit where applicable

    (f) Dissertation studies that are useful to educational agencies, wherever possible

PPBS Models and Components

PPBS as a form of program budgeting is associated with educational accountability because the basic goals and features of the system help to implement accountability. As a management tool, PPBS can be used at both the state and local educational agency levels to increase the effectiveness of the agency in comprehensive planning and program evaluation.

A basic Planning Program Budgeting System for education (Perkins, Cross, and Sicuro, 1970)[19] can be defined in terms of five major components: goals, objectives, programs, budgets, and evaluations.

> A *goal* is a statement of broad direction, purpose, or intent that is general and not concerned with particular achievements within a specified time frame. A goal is identified in terms of the needs of the community.

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[19] Joseph A. Perkins, Edward M. Cross, and N. A. Sicuro. "PPBS for Education." *Management Controls*. (February, 1970), pp. 23-26.

An *objective* is a measurable desired accomplishment whose attainment within a given time frame, and under specifiable conditions, can be evaluated. The attainment of the objective advances the system toward corresponding goals.

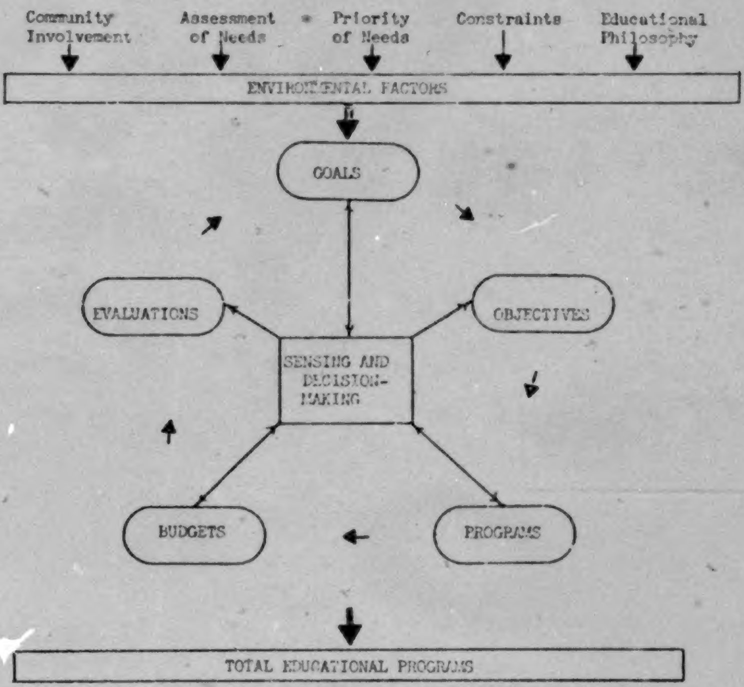
A *program* is a group of interdependent, closely related activities or services contributing to, or progressing toward, a common objective or set of similar objectives.

The *program budget* is a plan that relates proposed expenditures for programs to goals and objectives within a specific time frame, based on a program structure classification. It includes the proposed revenue source for financing programs.

Program evaluation is the systematic assessment of program information to ascertain the degree to which established program objectives have been accomplished.

The relationship of these PPBS components can be illustrated in Figure 3.2.

Figure 3.2 Relationship of PPBS Components


Community Involvement
Assessment of Needs
Priority of Needs
Constraints
Educational Philosophy
ENVIRONMENTAL FACTORS
GOALS
EVALUATIONS
OBJECTIVES
SENSING AND DECISION-MAKING
BUDGETS
PROGRAMS
TOTAL EDUCATIONAL PROGRAMS

Among the more salient models in the literature on PPBS is one set forth by Knezevich, et al., (1973)[20] who discuss at length the components of PPBS. Recognizing the incompleteness of the PPBS acronym, the authors identify other necessary processes with their corresponding tasks:

1. Planning	1.A	Formulating a future course of action
	1.B	Specifying long- and short-range goals
	1.C	Clarifying goals
2. Programming	2.A	Generating alternative approaches to goals
	2.B	Clustering activities related to objectives
	2.C	Developing operational plans
3. Budgeting	3.A	Translating programs into fiscal and non-fiscal requirements
	3.B	Determining programatic classification of planned expenditures
4. Analyzing	4.A	Specifying major assumptions, constraints, and uncertainties for each alternative
	4.B	Determining cost effectiveness of each alternative
	4.C	Rank ordering of cost-effectiveness index for an alternative
5. Deciding	5.A	Determining the optimum course of action or alternative for each goal
6. Evaluating	6.A	Reviewing outcomes and relating each to prior expectations
7. Recycling	7.A	Feeding evaluative judgments into the system to begin a modified program cycle

Another variation is provided by Merewitz and Sonnick (1971)[21] who describe a PPBS model containing five distinguishing features:

1. Program Accounting	A way of organizing information with the objective, revealing how much is being spent for each purpose

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[20] op. cit., *Program Budgeting (PPBS): A Resource Allocation Decision System for Education*, pp. 121-128.

[21] Leonard Merewitz and Stephen H. Sonnick, *The Budget's New Clothes* (Chicago: Rand McNally College Publishing Company, 1971), pp. 273-276.

2. Multi-year costing	The tabulation of expenditures for years beyond the budget year
3. Detailed description of activities	The elaboration of objectives targets, choices made, alternatives considered, outputs and effectiveness
4. Zero-based budgeting	The defense of a budget request without making reference to the size of previous appropriations
5. Quantitative evaluation	The use of cost benefit and cost effectiveness analysis of alternatives

Yet another variation is that of Furno, Collins, and Brian (1973)[22] who view PPBS as a cycle involving the following phases:

- Educational needs of the school district are identified
- Needs are then expressed in terms of educational goals
- Objectives are enumerated for each goal
- PPBS programs are developed to accomplish objectives
- Dollar cost figures must be developed for the program budget in terms of administrative cost centers, special projects, objects of expenditure, program, activities, and subactivities
- Operation and management of cost centers and special projects, in reality, the school districts' educational programs
- Program evaluation is concluded
- PPBS budget process is recycled in light of recommendations growing out of program evaluation

Basic components of a PPBS, as defined by the state of California and the U. S. Office of Education,[23] include:

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[22] Orlando F. Furno, George J. Collins, and George B. Brain, *Planning Programming, Budgeting Systems: A Practical Approach* (Baltimore, Maryland: Collins Litho, 1972).

[23] Sheila Krystal and Samuel Henrie, *Educational Accountability and Evaluation.* PREP Report No. 35. (Washington, D.C.: U. S. Office of Education, 1972).

1. A classified system of fiscal and educational data to help management make decisions about allocating resources to programs
2. Management goals and objectives, and a periodic recycling and review of them
3. Alternative program strategies for attaining objectives (if all the programs cannot be accommodated by the available resources, an analysis of possible alternative methods allows for a selection of preferred programs.)
4. Program budget format, a plan that relates proposed expenditures for programs to goals and objectives and includes the proposed revenue source for financing the programs
5. Cost effectiveness analysis which measures the relationship of program cost to expected achievement levels
6. Program analysis and evaluation, identifying programs responsive to stated goals and objectives (This determines the effectiveness of the program, or the degree to which it is accomplishing its objectives, and its efficiency, or the degree to which the allocated resources are being expended in the program.)
7. Recommended solutions or revision for improvement
8. Public involvement, particularly in establishing and reviewing goals and objectives responsive to a local district's community needs, and communicating the degree of achievement of the objectives to the citizens of the community

Wilsey and Schroeder (1974)[24] identify nine essential functional components of PPBS. These components include:

1. Select goals
2. Determine objectives
3. Analyze alternative programs and activities
4. Develop or revise programs and activities
5. Develop program accounting and budgeting procedures
6. Establish timetables

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[24] Carl E. Wilsey and Glenn B. Schroeder, *Roles of the Participants in Educational Accountability* (Denver: Cooperative Accountability Project, 1974).

7. Evaluate achievement of objectives

8. Report to the public

9. Evaluate system and revise

A derivative of PPBS and Program Planning Budgeting Evaluation System (PPBES) adapted for use in education is the Educational Resource Management System (ERMS) developed by the Research Corporation of the Association of School Business Officials.[25] ERMS places its emphasis on outcomes in contrast to relying on input measures as a means for evaluating the success of a system.

The major processes of ERMS are:

Planning	The process of guiding internal change so that the school adapts effectively to the dynamic society of which it is a part
Programming	The process of developing program plan
Budgeting	The process which includes, in addition to final reconciliation of programs and available resources according to established priority, the preparation of the budget documents, the approval by a board of education, and the execution of budgetary plans
Evaluation	The process of assessing the attainment of objectives and the worth of the program

ERMS currently is being implemented in 11 representative institutions, including small, medium, and large school districts in the United States, a Canadian province, and a community college.

Recently, Weiss and Sisson (1975)[26] have shifted the PPBS emphasis away from the program level to the individual student as the building block for comprehensive educational planning and budgeting. These authors state that the student-centered planning system is a set of procedures which allow planning decisions to be influenced by projections of individual needs. Each individual plan would have long- and short-range dimensions and include the following components:

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[25] William H. Curtis, *Educational Resource Management Systems* (Chicago: Research Corporation of the Association of School Business Officials, 1972), pp. 37-59.

[26] Edmond H. Weiss and Roger L. Sisson, "The Student as Planning and Cost Center: An Administrative System for the 1980's." *Phi Delta Kappan* 56 (December 1974), pp. 272-274.

- Number of staff required, by type
- Estimated costs for staff
- Facilities space, by type
- Cost of building or leasing space or facilities
- Materials, supply, and equipment costs
- Overhead cost (administration, utilities, etc.)

Under their concept, the individual student plans are aggregated, and resource requirements (staff, space, equipment, costs) are calculated and then fed into a sophisticated automated data management system which permits relatively easy manipulation and report generation from a data base made up of student records.

In addition to the variations detailed in this chapter, models have also been described by John Porter (1972)[27] and the Department of Public Instruction for the state of North Carolina.[28]

Problems with PPBS

A critique of PPBS by Benson and Hodgkinson (1974)[29] in their work, *Implementing the Learning Society*, maintains that this management tool "was vastly oversold" on three counts. First, some early advocates implied that PPBS could guide both broad and narrow allocations of resources in the public sector . . . Second, the system could be adopted on a large scale, not selectively or experimentally . . . Third, the opportunities for high-grade policy analysis, a critical aim of PPBS, are markedly different from one agency to the next." These same authors point out other difficulties, such as "PPBS assumes a flexibility that is frequently not present in public bureaucracies" and "PPBS assumes the acquiescence of public interest groups affected by major changes in the provision of services."

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[27] John W. Porter, "The Accountability Story in Michigan." *Phi Delta Kappan* (October, 1972), p. 28.

[28] North Carolina Department of Public Instruction, *Accountability: Review of Literature and Recommendations for Implementation* (Raleigh, North Carolina: Department of Public Instruction, May, 1972), pp. 12-15.

[29] Charles S. Benson and Harold L. Hodgkinson, *Implementing the Learning Society* (San Francisco: Jossey-Bass Publishers, 1974), pp. 34-44.

Technical limitations to PPBS are also cited by Levine (1960):[30]

- The technique is not yet routinized to the point where it can be managed by persons of modest competence
- Approximately four years are needed from initial design to fruitful results in a PPB system. Politically, politicians and upper-eechelon appointed executives must think in terms of efforts that yield perceptable, publicly demonstrable progress within one year or two
- Misuse of half-baked PPBS
- Resistance to change by vested interests
- PPBS is more technically pertinent to some disciplines and not others
- Will the information received be superficial and misleading?
- The techniques may be beyond the current capacities of many federal, state, and local agencies
- It assumes that meaningful goals exist against which programs can be tested and evaluated
- It calls for outstanding intelligence in the design and evaluation phase and solid competence in its operations

Moreover, the following limitations can be implied from Browder (1971, 1975)[31] to explain some of the confusion between what PPBS is and what it does:

- The development of program budgeting and long-range comprehensive planning is still rudimentary and far from integrated into the resource allocation process

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[30] Melvin R. Levin, *Community and Regional Planning: Issues in Public Policy*. Praeger Special Studies in U. S. Economic and Social Development (New York: Frederick A. Praeger, Publishers, 1969), pp. 42-63. Reprinted by permission in Melvin R. Levin and Alan Shank, *Educational Investment in an Urban Society* (New York: Teachers College Press, 1970).

[31] op. cit., *Emerging Patterns of Administrative Accountability; Who's Afraid of Educational Accountability.*

- Information on the cost and effectiveness of proposed programs is often lacking or unreliable

- Evaluation of the actual costs and effectiveness of programs is often lacking or invalid

Summary of PPBS

Through this discussion of PPBS, two major approaches have emerged. The first is what might be called a top-to-bottom PPBS approach that begins with the state educational agencies and filters through to the local school system/district and school level. The second is a "bottom-to-top" PPBS approach, emphasizing student-centeredness as the primary unit from which costs can be aggregated to school program(s); school (elementary, middle, secondary); school district/systems; and state levels for decision-making and legislative budgetary purposes. How effective either PPBS approach is as applied to education has yet to be determined. In the meantime, other management techniques have emerged and are evolving in education.

Management by Objectives (MBO)

A second man-managing tool being applied to education is Management by Objectives, identified by the acronym MBO. Although it is not a new term to business and industrial management, the concept is relatively new to education. The writings of Drucker (1954)[32] and McGregor (1960)[33] clearly brought the concept of MBO to popularity in management during the 1950s. Sometimes called "management by results" because of its focus on outcomes rather than activities, a broader interpretation of MBO at top level management and control began to emerge during the '60s. The call for educational accountability infused MBO into the management arena of educational agencies. Later, Knezevich (1973)[34] considered it to be an essential subset of the PPBS movement.

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[32] Peter T. Drucker, *The Practice of Management* (New York: Harper & Row, 1954).

[33] D. M. McGregor, *Human Side of Enterprise* (New York: McGraw-Hill, 1960).

[34] op. cit., *Program Budgeting (PPBS): A Resource Allocation Decision System for Education.*

The Concept of MBO

Several writers provide in laymen terms an overview of the MBO concept. Simply stated, Uris (1968)[35] describes MBO as "job performance and achievement guided by desired results." Odiorne (1971)[36] elaborates:

> When we manage by objectives we mean simply that we fix our ultimate purposes in mind before we start our journey. The objectives then become a target, a goal, a desired outcome, and along the route become a criterion for measuring progress. Finally, when we have spent our time and energies we are able to evaluate the degree of success by measuring it against the objective.

Another writer, Anderson (1974)[37] interprets MBO as a one-, two-, three-, four-step approach.

> First, you establish an objective. Second, you plan how to meet that objective. Third, you implement the plan. And fourth, you create a system to evaluate your progress and success.

Finally, Read (1974)[38] describes the major premises of MBO as applied to education:

> Educational administration takes place within a socioeconomic system that constitutes the environment of a given sub-system. This environment is a changing one that poses new conditions and requirements upon the school from time to time. (At the present time, school managers are facing the demands of accountability.)
>
> MBO is a way of managing, aimed at responding effectively to these new requirements. It presumes that the first step in the management process is to identify, by one means or another, the goals of the organization.

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[35] A. Uris, *Mastery of Management* (Chicago: Playboy Press Book, 1968).

[36] G. S. Odiorne, "Management by Objectives." *College and University Journal.* 10, No. 2 (March, 1971), p. 13.

[37] B. Robert Anderson, "Who's Afraid of MBO?" *School Management.* 18, 9 (November-December, 1974), p. 26.

[38] E. A. Read, "Accountability and Management by Objectives." *NASSA Bulletin.* LVII, No. 380 (March, 1974), p. 3.

> Once the goals have been identified, orderly procedures are established for assigning responsibilities to individual administrators and eventually to staff members in such a way that their combined efforts are directed toward achieving those goals.
>
> The success of a school manager can be measured by using as criteria the objectives that were established for his/her sub-system and the particular responsibilities assigned to him/her for their achievement.

Implementing MBO

Some practical ways of implementing the management by objectives approach are discussed in the popular book, *The Peter Prescription*, in which Peter (1972)[39] equates MBO to "Management for Competence." Peter Prescriptions 26-35 identify the ways in which management skills can be developed, improved, and continually reinforced both on the job and in the classroom:

Peter Prescriptions 26-35

26. The Peter Prospect:	Identify your objective(s)
27. The Peter Proposal:	Establish criteria of successful accomplishment
28. The Peter Panel:	Involve the personnel in the establishment of objectives
29. The Peter Policy:	Make group goals compatible with individual goals
30. The Peter Position:	State the objective in terms of the need it serves rather than the form it takes
31. The Peter Practicality:	Make the objective one that can be achieved
32. The Peter Point:	Communicate the objective by word and deed
33. The Peter Portion:	Let others join in the process of establishing interim objectives
34. The Peter Precision:	State objectives in specific, observable, or measurable terms
35. The Peter Peace	Be satisfied to stop

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[39] Lawrence J. Peter, *The Peter Prescription* (New York: Bantam Books, Inc., 1973), pp. 141-154.

MBO Process in Education

Cook (1970)[40] addresses management by objectives as a cyclical process which includes the following:

Analyzing situation and needs

Setting of goal(s)

Studying alternate programs for achieving objectives

Developing objectives

Reviewing costs, benefits, and resources

Choosing most suitable programs or achieving objectives

Carrying out program

Assessing results

Reviewing and playing new cycle, i.e., goals

When he spoke before the West Virginia Association of School Administrators, U. S. Commissioner of Education Terrel H. Bell (1974)[41] described MBO as a management system oriented to attaining institution-wide performance accountability in a school district. He provided fourteen steps for achieving MBO in school management:

Assess the most critical educational needs in the school districts

Review the results of the needs assessment

Identify some high-level performance priorities

Write system-wide critique of superintendent's tentative performance priorities

Review all feedback from the schools

Formulate final performance priorities for the coming academic year

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[40] J. M. Cook, *Management by Objectives: A Workshop Guide for Developing Program Objectives* (College Park, Maryland: University of Maryland, Baltimore County Campus, 1973).

[41] Terrel H. Bell, "Management by Objectives: Planning Where to Go and How to Get There." (Speech delivered before the West Virginia Association of School Administrators, Jackson's Mill, West Virginia, July 16, 1974).

Issue final performance priority statements by superintendent

Solicit written performance and outcome-oriented objectives from each school in areas of administration, instruction, and support services

Solicit each central office staff to review and respond to the written objectives prepared by each school to make sure that resources necessary to accomplish a school's objectives will be available

List objectives which become performance commitment between the schools and superintendent

Develop an operational plan

Implement an operational program

Monitor progress of programs

Evaluate performance outcomes

He concludes: "MBO provides the school administrator with a systematic procedure for involving his staff in problem-solving efforts . . . (It) keeps all staff members looking at the same targets and pulling towards performance outcomes . . . accepted as desirable objectives . . . MBO provides the road map that all can read and from which all can attain a certain sense of momentum and accomplishment . . . "[42]

Problems with MBO

As with any system, MBO is not without its problems. Some of the more frequently cited have been addressed by Uris (1968):[43]

Heel-dragging participation:	Resistance to pursue a new program by insecure manager, afraid to give up the comfortable old ways
Setting low standards:	Committing oneself to objectives that involve no challenge, hoping thereby to overachieve

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[42] Ibid., p. 4.

[43] op. cit., *Mastery of Management*, pp. 165-166.

Quantifying objectives: Difficulty in quantifying objectives; for example, morals and attitude

Editorial on MBO

To attain the "Images of the Future in Education" that Toffler (1971) addresses in *Future Shock*[44] and *Learning for Tomorrow*,[45] MBO will spiral into a major building block for tomorrow's school system management and finance arenas. Without such a focus, more personnel, materials and money will be expended without anyone knowing what is being achieved, and accountability, as a major reconstructive force in education, will become null and void. The authors of this document believe:

> If you don't know where you are, where you want to be, and how you are getting there, you'll wind up somewhere else at a cost commensurate with such incompetence.

Management Information Systems (MIS)

The acronym MIS signifies another useful concept and management tool in the organization of state and local educational agencies and, more recently, the school. MIS represents a fusion between management science and computer technology which, in general, is designed to make all pertinent data available to given information requirements of the school administrators.

Since the design of an effective PPBS system is predicated on (1) a substantial, reliable flow of timely information, probably through a computerized system; and (2) the existence of a program design that organizes information in a meaningful framework for decision, MIS has become an increasingly useful management tool.

Maryland and Wisconsin MIS Operationalized Models

MIS operates within state educational agencies in both Maryland and Wisconsin. In Maryland, Fox and Herskowitz (1973)[46] describe MIS as "A system for collecting, tabulating, and manipulating data to provide management personnel with timely, meaningful information for effective decision making." The components of the Maryland MIS follow:

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[44] Alvin Toffler, *Future Shock* (New York: Bantam Books, Inc., 1971).

[45] Alvin Toffler, et al, *Learning for Tomorrow* (New York: Bantam Books, Inc., 1974), pp. 3-19.

[46] George E. Fox and Martin Hirschkowitz, *Management Information Systems Development for a State Department of Education.* Technical Report No. 01722.01-2 (Silver Spring: VITRO Laboratories Division, 1973).

1. Initial planning
2. Assessment of user needs
3. Formulation of alternate information flow models
4. Evaluation of flow models
5. Selection of a primary information flow model
6. Implementation of the model
7. Performance of an operational review of information flow components
8. Reports on outcomes of MIS for given project or program t decision makers

In Wisconsin, Buckmiller (1974)[47] regards MIS as a way of obtaining data to be used to analyze operational performance and to make decisions about changes or improvements which increase productivity. He cites five MIS components:

1. A cost-per-person-hour accounting subsystem
2. Performance standards for products or services
3. A performance reporting system
4. A management review process
5. A program budgeting system

Buckmiller maintains that the components provide the means to obtain the basic data by which costs, standards, and performance may be linked together, analyses undertaken, and decisions made to achieve maximum program service or product levels with the resources provided.

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[47] Archie E. Buckmiller, *Increased Productivity: A Potential Response to High Public Service Cost.* Information Series Vol. 4, No. 2 (Division of Management and Planning Services, Wisconsin Department of Public Instruction, October, 1974).

Limitation of MIS

One of the gravest deficiencies in MIS has been the tendency to gather data for top-level decision making without considering the source or the cost.

An axiom applicable to all data-gathering processes is that unless the data are useful and valuable at the source, they will be useless and valueless at the destination. A second pertinent axiom is that the data-gathering and utilization process must be cost justifiable. Data too expensive to gather, when compared with the benefits derived from being able to report them, are not justifiable to collect. By systematizing the work processes, the data can be made to work at the source, producing desired information output as a by-product of the work process. For example, student evaluation data become a by-product of an automatic grade reporting system.

Uniform Accounting Procedures (UAP)

As early as 1909, the U. S. Office of Education,[48] in cooperation with other national and state organizations, sought uniform recording and reporting procedures for educational financial transactions.

In 1948, the main headings for expenditure accounts for K-12 educational institutions were (1) Administration, (2) Instruction, (3) Auxiliary Services. (4) Operation of Plant, (5) Maintenance of Plant, (6) Fixed Charges, (7) Capital Outlay, and (8) Debt Services. In 1957, the U. S. Office of Education substantially revised these expenditure account classifications in *Handbook II*:[49]

1. Account Series 100 - Administration
2. Account Series 200 - Instruction
3. Account Series 300 - Attendance Services
4. Account Series 400 - Health Services
5. Account Series 500 - Pupil Transportation Services

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[48] op cit., *Program Budgeting (PPBS): A Resource Allocation Decision System for Education*, 152.

[49] U. S. Department of Health, Education, and Welfare, Office of Education, *Handbook II, Revised: Financial Accounting: Classification and Standard Terminology for Local and State School Systems*, by Charles T. Roberts and Allen R. Lichtenberger (Washington, D. C.: U. S. Government Printing Office, 1973). For the purpose of accountability cost, only expenditure accounts will be reviewed. For other dimensions of accounting, the reader is referred to more comprehensive books on business management of local school systems or universities.

6. Account Series 600 - Operation of Plant
7. Account Series 700 - Maintenance of Plant
8. Account Series 800 - Fixed Charges
9. Account Series 900 - Food Services
10. Account Series 1000 - Student Body Activities
11. Account Series 1100 - Community Services
12. Account Series 1200 - Capital Outlay
13. Account Series 1300 - Debt Service from current funds
14. Account Series 1400 - Outgoing Transfer Accounts

Knezevich and Fowlkes (1960)[50] made several observations about these changes:

> First, the number of major headings increased from eight in 1948 to 14 in 1957, reflecting the greater complexity of educational services. Most of the increase can be traced to what happened to the account classification for Auxiliary Services. Thus, activities previously grouped under Auxiliary were split into five difference special account headings for Health Services, Pupil Transportation Services, Food Services, Student Body Activities, and Community Services. Second, these major headings document the propensity of schools to use functional groupings rather than objects of expenditures alone. For example, Administration and Instruction represent functions, but student body Activities and Outgoing Transfer Accounts do not quality as functions.

Again, in 1975, *Handbook II* was revised. *Handbook II, Revised, Financial Accounting: Classifications and Standard Terminology for Local and State School Systems,*[51] contains the unique feature of the grouping of each financial transaction into three primary dimensions for finance record keeping:

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[50] Stephen J. Knezevich and J. G. Fowlkes, *Business Management of Local School Systems* (New York: Harper & Row, 1960), pp. 116-123.

[51] op. cit., *Handbook II Revised: Financial Accounting* (Washington, D.C.: U. S. Government Printing Office, 1973), p. 51.

Grouping I - Fund

Grouping II - Object

Grouping III - Function

Figure 3.3 Summary of Expenditure Accounts

A - Fund

1 General Fund
2 Special Revenue Fund
3 Debt Service Fund
4 Capital Project Fund
5 Food Service Fund
6 Pupil Activity Fund
7 Trust and Agency Funds
8 General Fixed Assets
9 General Longterm debt

B - Objects

100 Salaries
200 Employee Benefits
300 Purchased Services
400 Supplies and Materials
500 Capital Outlay
600 Other Objects
700 Transfers

C - Functions

1000 Instruction

1100 Regular Programs
1200 Special Programs
1300 Adult Continuing Programs

2000 Supporting Services

2100 Support Services - Pupils
2200 Support Services - Instructional Staff
2300 Support Services - General Administration
2400 Support Services - School Administration
2500 Support Services - Business
2600 Support Services - Central
2700 Other Supporting Services

3000 Community Services

    3100 Direction of Community Services
    3200 Community Recreation Services
    3300 Civic Services
    3400 Public Library Services
    3500 Custody and Care of Children Services
    3600 Welfare Activities Services
    3800 Nonpublic School Pupil Services
    3900 Other Community Services

4000 Nonprogrammed Charges

    4100 Payments to Other Governmental Units (within the state)
    4200 Payments to Other Governmental Units (outside the state)
    4300 Transfers of Funds

5000 Debt Services

Other new dimensions for the finance record keeping include:

(D) Operational Units; (E) Program; (F) Source of Funds;
(G) Fiscal Year; (H) Instructional Organization;
(I) Assignments; (J) Term; and (K) Special Cost Center.

The revised *Handbook II* is the basic guideline for modifying existing accounting procedures to become more uniform in state and local educational agencies across the country. As a single case study, Maryland's adaptation and expansion of *Handbook II, Revised* is examined.

Maryland's Financial and Accounting Procedures

The Maryland State Department of Education (MSDE) has long recognized the necessity of maintaining a statewide uniform accounting system. Such a uniform system necessitates a manual which is subject to regular review and revision. Concurrent with the effort to revise the U.S. Office of Education *Handbook II, Financial Accounting for Local and State School Systems*, the MSDE began examining its *Financial Reporting Manual*[52] along with the early drafts of *Handbook II, Revised*.

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[52] *Financial Reporting Manual Maryland Public Schools* (Baltimore: Maryland State Department of Education, 1970).

A representative committee of MSDE and local school finance personnel, after a year of study, recommended to the state superintendent that *Handbook II, Revised* be adopted by the MSDE. A subsequent hearing with the State Board of Education ended with a charge to the MSDE to reconsider the adoption of *Handbook II*, since the local superintendents objected strenuously to its adoption. The objections involved the changes that would occur in local budgeting procedures and the relationship of local board budgets to local fiscal authorities. The superintendents were united in their objection to any change in the State law governing local fiscal relationships.

A committee was subsequently established to work on the revisions to the *Maryland Financial Reporting Manual* which would incorporate the PPBS concepts of federal *Handbook II, Revised*, but not violate local fiscal relationships. The committee developed a draft manual and a procedure for maximum involvement of local fiscal personnel and superintendents. The final version of Maryland's manual will include the following sections:

Section A - Presently Adopted Manual
Section B - Program Reporting - Cost Accounting
  Part I - Classification and Definition of Revenue Accounts
  Part II - Classification and Definition of Expenditure Accounts
  Part III- Indirect Costs and Prorations
  Part IV - Implications of Program Reporting - Cost Accounting
  Part V - Program Definitions for Accountability
  Part VI - Reporting Procedures and Requirements

At this writing, agreement has been reached and a final document is in preparation. The Revised Financial Reporting Manual will be implemented for use in budgeting and reporting in Fiscal Year 1977.[53]

The revision provides for complete program accounting with a clear crosswalk to federal *Handbook II, Revised*, while it in no way alters the existing law (Figure 3.4).

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[53] Maryland State Department of Education, *Financial Reporting Manual Maryland Public Schools: Revised*. The revised manual is currently being completed by the MSDE Governance Committee for the Maryland Financial Manual. This Revised Manual is scheduled for publication by July 1, 1976.

Figure 3.4 *Maryland Financial Reporting Manual*
Proposed Revision to Financial Report Forms

Categories

Handbook II		PreK-6	Middle,Jr.	High	Handbook II Revised		
01.00	Administration				2000		
.10	General Support Services				2300		
.20	Board of Education					2310	
.30	Executive Administration					2320	
.50	Business Support Services				2500		
.51	Facilities Acquisition and Construction					2530	
.59	Other Business Support Services					2520	2570
.60	Centralized Support Services				2600		
02.00	Instruction				1000		
.10	Regular Programs				1100		
.11	Art	XXX					
.12	English Language Arts	XXX	___	___			
.13	Foreign Language	XXX	___	___			
.14	Industrial Arts	XXX	___	___			
.15	Mathematics	XXX	___	___			
.16	Media Services	XXX	___	___			
.17	Music	XXX	___	___			
.18	Physical Education	XXX	___	___			
.19	Science	XXX	___	___			
.20	Social Studies	XXX	___	___			
.21	Driver Education	XXX	___	___			
.22	Regular Day School	XXX	___	___			
.23	After School	XXX	___	___			
.24	Summer School	XXX	___	___			
.25	Other Regular Programs	___	___	___			
.30	Special Programs				1200		
.31	Programs for the Gifted and Talented					1210	
.32	Special Education Programs for Handicapped					1220	
.33	Resource Room Programs						1221
.34	Self-Contained Programs						1222
.35	Home and Hospital Teaching						1223
.36	Other Programs for Handicapped						1229
.40	Adult Education				1300		
.41	School Administration				2400		
.50	School Instructional Support Services				2000		
.51	Instructional Direction Services				2330		
.52	Regular Programs						2331
.54	Special Education						2332
.55	Improvement of Instructional Staff					2210	

.56	Regular Programs			
.57	Special Education			
.58	Instructional Media Support		2220	
.60	Other Services			
.61	Guidance		2120	
.62	Regular Programs			
.63	Special Education			
.64	Psychological Services		2140	
.65	Regular Programs			
.66	Special Education			
.67	Speech, Language, Audiology		2150	
.68	Regular Programs			
.69	Special Education			
.70	Diagnostic and Prescriptive Services		2160	
.71	Regular Programs			
.72	Special Education			
03.00	Pupil Personnel Services			
.01	Regular Programs			
.02	Special Education			
04.00	Health Services		2130	
.01	Regular Programs			
.02	Special Education			
05.00	Pupil Transportation		2550	
06.00	Operation of Plant		2540	
07.00	Maintenance of Plant		2540	
.01	Repair Maintenance			
.02	Preventive Maintenance			
.03	Minor Modernizations and Alterations & Code Corrections			
08.00	Fixed Charges	5000		
09.00	Food Services		2560	
10.00	Student Body Activities	2900		
.01	Athletics			2911
.02	School Entertainments			2912
.03	School Publications			2913
.04	Co-Curricular Activities			2914
.05	Materials Purchased for Resale		2920	
11.00	Community Services	3000		
.01	Nonpublic School Pupil Services	3700		
.02	Other Community Services	3800		
12.00	Capital Outlay			
13.00	Debt Service			
14.00	Outgoing Transfers	4000		
	Payments to Other Governmental Units (in-state)	4100		
	Payments to Other Governmental Units (out-of-state)	4200		
	Transfers of Funds	4300		

Objects

Handbook II			Handbook II Revised	
Object	Subobject		Object	Subobject
.01		Salaries and Wages	10	
.02		Contracted Services	30	
	.01	Repair and Maintenance to Vehicles		32
	.02	Private Operators - Pupil Transportation		33
	.03	Public Carriers - Pupil Transportation		33
	.04	Bus Inspection - Pupil Transportation		33
	.05	Other		39
.03		Supplies and Materials	40	
	.01	Text Media		42
	.02	Library Media		43
	.03	Gasoline and Oil (Pupil Transportation and Driver Education)		46
	.04	Parts (Pupil Transportation and Driver Education)		47
	.05	Other		49
.04		Other Charges	20,60	
	.01	Travel Expenses - Pupil Transportation only		33
	.02	Employee Retirement		20
	.03	Social Security		20
	.04	Other Employee Benefits		20
	.05	Insurance (Transportation and Driver Education)		20
	.06	Other		60
.05		Land, Buildings and Equipment	50	
	.01	Vehicles - Additional		55
	.02	Vehicles - Replacement		55
	.03	Equipment - Additional		54
	.04	Equipment - Replacement		54
	.05	Alterations to Buildings		52
	.06	Site Improvements		51

Summary

Educational Accountability has become an impetus to educational administrators to become more fluent and efficient in technology and methodology for analysis of the educational process. Chapter III reviewed four of the major man-information management tools currently being used by educational administrators and finance personnel to run state and local educational agencies more efficiently; namely, Program Planning Budgeting Systems, Management by Objectives, Management Information Systems, and Uniform Accounting Procedures. These tools and others, such as Operations Research (OR), are being adapted to education from the management experience and methods planned, implemented, and developed by business and industry. As such, the mode management is taking in education, under the influence of an accountability atmosphere, is one cited in the literature as management of education for results--a possible educational hallmark for the late 1970s (Morrisey, 1970;[53] Hostrop, 1973).[54] This management form has the potential of making education efficient enough to exceed the expectations of legislators and the demands of the public, and of being more sensitive to needs of teachers and students in the learning setting. Educational management will be responsible, in the future, for evaluating the effectiveness of this transition.

Chapter IV presents an integration of concepts from each of these management tools into a result-oriented mechanism known as the Objective-Referenced Program Management Cost Model.

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[53] George L. Morrisey, *Management by Objectives and Results* (Menlo Park, California: Addison-Wesley Publishing Company, 1970.

[54] Hostrop, Richard W., *Managing for Results* (Homewood, Illinois: ETC Publications, 1973).

CHAPTER IV

THE OBJECTIVE-REFERENCED PROGRAM COST MODEL:

A BLUEPRINT

Chapter Objectives

- To identify the term "Objective-Referenced (O-R) Program Cost Model"
- To construct and evaluate cost-related objectives--an overview
- To identify the components of an Objective-Referenced Program Cost Model
- To construct a hierarchical structure of goals, objectives, activities, and tasks
- To identify the three major dimensions and subordinate elements of the Objective-Referenced Program Cost Model
- To sketch the educational management program cost coding structure
- To sketch the flow of cost coding
- To identify various types of costs
- To sketch the "Structure of Objectives"
- To sketch the functional elements of the Objective-Referenced Program Cost Model

Accountability is essentially objective-referenced since it is at the level of the objective that one becomes specific as to action and accomplishment. Goals may state generally what is desired, but not in measurable language. Activities and tasks, on the other hand, call out specific actions but do not necessarily state measurable outcomes. However, specific accomplishment can only be determined by reference to objectives.

The idea of being "objective-referenced" suggests:

1. The achievement of pre-established objectives will be sought in educational programs at each level of the educational system.

2. The objectives are stated in such a way as to make it feasible to collect costs and determine program effectiveness.[1]

3. A hierarchical relationship exists between goals, objectives, activities, and tasks. This relationship is sometimes called programming objectives.

How To Write and Evaluate Cost-Related Objectives

Any of the blueprint specifications for the O-R Program Cost Model should be prefaced by some knowledge of both the make-up of a well-written, cost-related objective and the means by which an administrator can evaluate objectives. This is necessary since much attention is given later to the actual work-up of the cost reporting structure found in the remaining chapters.

Many ways of writing objectives can be found in the educational management literature. However, only a few authors have specified what costing elements are to be inserted into the objective. A framework for writing cost elements into objectives and one applicable to the O-R Program Cost Model is provided by Morrisey (1970).[1] His criteria for a well-formulated objective include some cost considerations (particularly Nos. 4, 9, and 10)below:

(1) It starts with the word "to" followed by an action verb

(2) It specifies a single key result to be accomplished

(3) It specifies a target date for its accomplishment

(4) It specifies maximum cost factors

(5) It is as specific and quantitative (and hence measurable and verifiable) as possible

(6) It specifies only the "what" and "when"; it avoids venturing into the "why" and "how"

(7) It relates directly to missions and objectives

(8) It is realistic and attainable

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[1] George L. Morrisey, *Management by Objectives and Results* (Menlo Park, California: Addison-Wesley Publishing Company, 1970), p. 62.

(9) It provides maximum payoff on the required investment in time and resources, and compared with other objectives being considered

(10) It is consistent with resources available or anticipated

(11) It avoids or minimizes dual accountability for achievement when joint effort is required

(12) It is consistent with basic company and organizational policies and practices

(13) It is willingly agreed to by both superior and subordinate, without undue pressure or coercion

(14) It is recorded in writing, with a copy kept and periodically referred to by both superior and subordinate

(15) It is communicated not only in writing, but also in face-to-face discussions between the accountable

These criteria can be used as a guideline from which administrators can construct their own cost-related objectives.

In another book written by this same author,[2] several key questions are stated which can be used to assist program administrators and managers in evaluating stated objectives:

(1) Is the objective statement constructed properly?
To (action verb) (single key result) by (date) at (cost)

(2) Is it measurable and verifiable?

(3) Does it relate directly to the manager's roles and missions and to higher-level roles, missions, objectives?

(4) Can it be readily understood by those required to implement it?

(5) Is the objective a realistic and attainable one that still represents a significant challenge to the manager and his organization?

(6) Will the result, when achieved, justify the expenditure of time and resources required to achieve it?

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[2] George L. Morrisey, *Appraisal and Development Through Objectives and Results* (Reading, Massachusetts: Addison-Wesley Publishing Company, 1972).

(7) Is the objective consistent with basic company and organizational policies and practices?

(8) Can the accountability for final results be clearly established?

Both the writing and/or the evaluating of the objective structure are necessary administrative functions in the implementation phase of the O-R Program Cost Model since it is the administrator who can be held accountable for the objectives and, eventually, for success or failure to accomplish those objectives.

Blueprint of An O-R Program Cost Model

At the objective level, accounting and accountability can be brought together to produce the "Cost of Educational Programs" which measures both the cost and the accomplishment of the same thing. The task of establishing an Objective-Referenced Cost Model for Educational Programs is essentially one of identifying the components of accountability costs as they relate to accounting components, then applying procedures to a model which, when overlayed on the accounting system, produces the data necessary for the accountability process.

A blueprint of the O-R Program Cost Model shows it to have five critical stages:

Stage 1: An Identified Set of Educational Program Components

Stage 2: An Identified Framework for Coding

Stage 3: An Identified Level and Type of Cost Collection

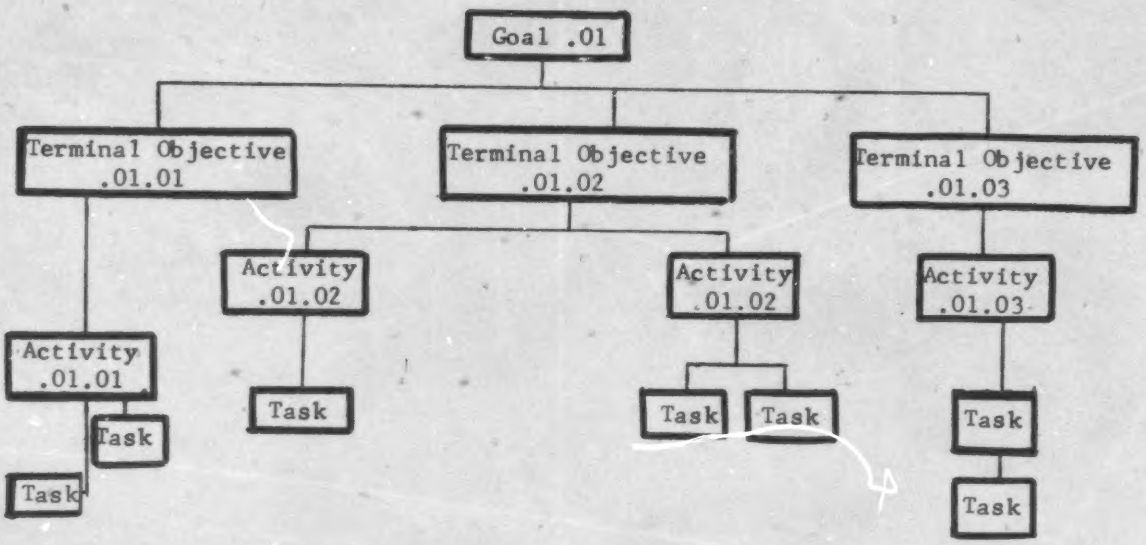
Stage 4: An Identified Set of Management Costing Tasks

Stage 5: An Identified Generalizable Model

Stage 1: Identification of Educational Program Components

Accountability plans fit into the management by objectives (MBO) administrative pattern which, in turn, forms the basis of a Program/Plan/Budget. The plan is expressed in terms of stated goals, terminal objectives, activities, and tasks arranged in a hierarchical relationship (Figure 4.1).

Figure 4.1 Hierarchical Relationship of Goals, Objectives, Activities and Tasks


Goal .01
Terminal Objective .01.01
Terminal Objective .01.02
Terminal Objective .01.03
Activity .01.02
Activity .01.02
Activity .01.03
Activity .01.01
Task
Task
Task
Task
Task
Task
Task
Task

Although the objective level is the proper level for collecting costs, the activity and task levels also provide necessary information in the O-R Program Cost Model. At each task level it is possible to identify the "things" which will be needed, such as manpower requirements, materials, and supplies. In an accounting system these "things" are referred to as "objects (and sub-objects) of expenditure." At the activity level it is possible to identify the person in both management and activity responsible for that activity. Responsibility is an essential element of accountability. For the purposes of the model the responsibilities embodied in the activities will be entitled "Component Costs." It will therefore be a rule of activity construction that a single activity may not call for more than one component cost. Terminal objectives must be stated in such a way that they are under the specific jurisdiction of one and only one section, office, unit, or division in the SEA, LEA, or school. Such jurisdiction is closely identifiable with the "categories of cost" found in school accounting systems. Goals, on the other hand, by their global nature are stated in general terms. They are not identifiable with existing structures as they may cross organizational and functional lines.

To summarize:

(a) Goals are stated in general terms and can cross all dimensions of cost.

(b) Terminal Objectives are stated in such a way that they are discrete to one specific "Category of Cost."

(c) Activities are stated so that they are within one specific "component."

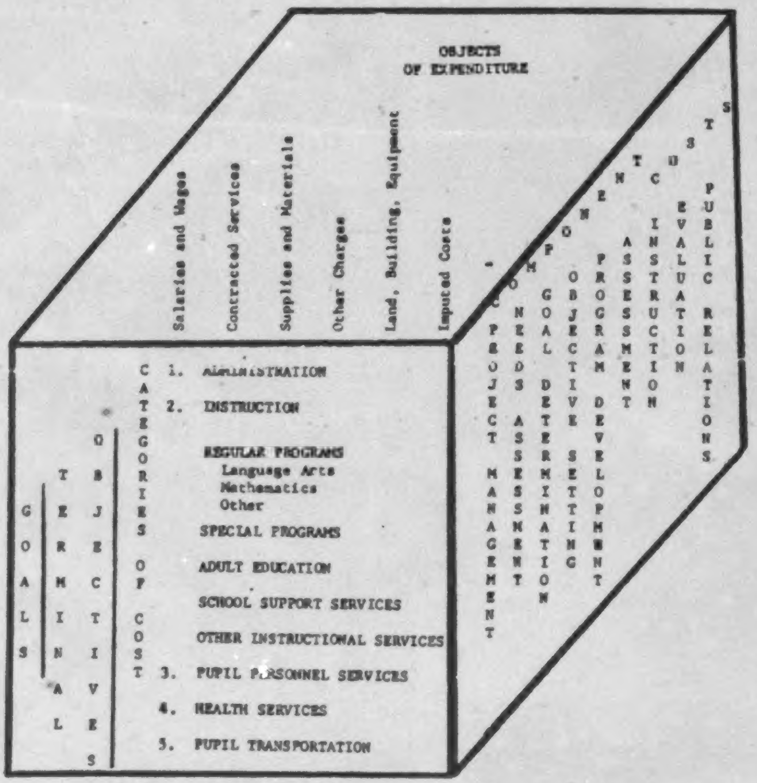
(d) Tasks are stated in detail so that the objects of expenditure can be identified, coded, and costed.

Stage 2: Development of a Framework for Coding

Objects of expenditure, component costs, and categories of costs are dimensions of the cost of accountability which mesh with existing accounting structures. They are meaningful to accountability only when they are related specifically to the objectives and goals.

Figure 4.2 presents the O-R Program Cost Model in the form of a three-dimensional cube.

Figure 4.2 Dimensions of O-R Program Cost Model


OBJECTS OF EXPENDITURE
Salaries and Wages
Contracted Services
Supplies and Materials
Other Charges
Land, Building, Equipment
Imputed Costs
COMPONENTS
PROJECT MANAGEMENT
NEEDS ASSESSMENT
GOAL DETERMINATION
OBJECTIVE SETTING
PROGRAM DEVELOPMENT
ASSESSMENT
INSTRUCTION
EVALUATION
PUBLIC RELATIONS
GOALS
TERMINAL
OBJECTIVES
CATEGORIES OF COST
1. ADMINISTRATION
2. INSTRUCTION
REGULAR PROGRAMS
Language Arts
Mathematics
Other
SPECIAL PROGRAMS
ADULT EDUCATION
SCHOOL SUPPORT SERVICES
OTHER INSTRUCTIONAL SERVICES
3. PUPIL PERSONNEL SERVICES
4. HEALTH SERVICES
5. PUPIL TRANSPORTATION

Each of the three visible facets of the cube is labeled for a particular dimension of Program Cost. These dimensions are:

(a) *Category of Cost* - these categories (e.g., Administration, Instruction, etc.) are defined in ***Federal Accounting Handbook II*** (if a system is ready to switch to ***Handbook II, Revised***, then substitute those new categories here). For Maryland's purposes, these categories are further partitioned into Goals and Terminal Objectives. The cost coding structure in this case is given in Figure 4.3.

Figure 4.3 Cost Coding Structure

.01	.01	.01	.999	.01	.99
GOAL	OBJECTIVE	CATEGORY	COMPONENT	OBJECT	Optional SUB OBJECT

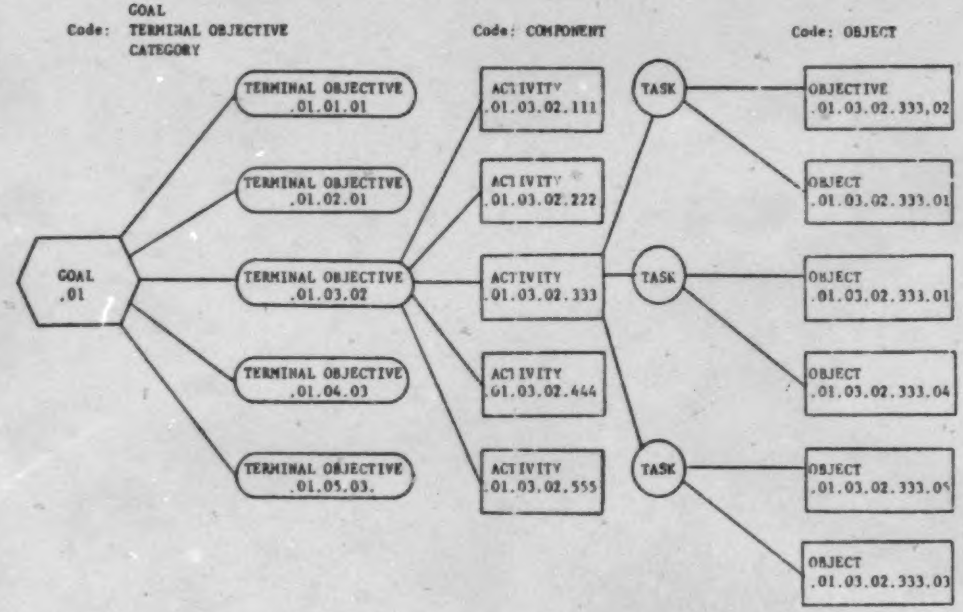
(b) *Object of Expenditure* (Sub-object optional, as defined in (a) above).

(c) *Component Costs* - those activity groupings most frequently found in the accountability program. They are necessarily closely identified with an area of responsibility. These functional groupings may already exist under another name in a local setting, such as cost center, unit, office, etc.

Stage 3: Identified Level and Type of Cost Collection

Level of Cost Collection. Figure 4.4 illustrates the manner in which administrators plan to the task level in order to find the specific "Object of Expenditure."

Figure 4.4 Flow of Cost Coding


Code: GOAL
TERMINAL OBJECTIVE
CATEGORY
Code: COMPONENT
Code: OBJECT
GOAL .01
TERMINAL OBJECTIVE .01.01.01
TERMINAL OBJECTIVE .01.02.01
TERMINAL OBJECTIVE .01.03.02
TERMINAL OBJECTIVE .01.04.03
TERMINAL OBJECTIVE .01.05.03.
ACTIVITY .01.03.02.111
ACTIVITY .01.03.02.222
ACTIVITY .01.03.02.333
ACTIVITY .01.03.02.444
ACTIVITY .01.03.02.555
TASK
TASK
TASK
OBJECTIVE .01.03.02.333,02
OBJECT .01.03.02.333.01
OBJECT .01.03.02.333.01
OBJECT .01.03.02.333.04
OBJECT .01.03.02.333.05
OBJECT .01.03.02.333.03

The costs of activity and tasks are only important as they are aggregated to form the terminal objective. Therefore, it is not necessary to code each activity and task. It is desirable to code and collect costs by object, component, category, objective, and goal.

Type of Costs. Any discussion of cost must begin with some definitions of exactly what is to be included in the term "cost." Contrary to general understanding, the term "cost" is far from an absolute. Finance professionals maintain that exacting rules govern the contents of any set of cost data, and it becomes important to address the question of whether to include costs which cannot be identified directly with the action to be costed. According to Curtis (1972), "Program costs should include only those resources that can be related directly to program effectiveness." Direct costs alone, in some cases, fall short of the proper base for program evaluation. One program could have high direct expense and low support cost while another could have costs of an opposite nature. A program using computer-assisted instruction, for example, would have higher indirect costs proportionately than one in which individual teachers were involved, especially beginning teachers.

It is highly important that the uniform accounting procedures within a state system contain exact definitions so that all cost considerations are handled in a precise manner.

Any deviation from accepted national standards should be kept in mind lest comparisons with other states or national data produce distortions. Although the *Handbook II, Revised* addresses most of the questions, it does not supply adaptable standards concerning the inclusion of costs.

It may be utopian to suggest that education seek to identify accounting policies and procedures which can be universally accepted as the Certified Public Accounting Profession has done for industry and has attempted to do for governmental finance. The Association of School Business Officials (ASBO) has supported Dr. Samuel B. Tidwell's textbook in school accounting.[3] While this publication contains the basics of school accounting, it leaves discretion in the hands of the local educational agency on such items as cost proration.

Furthermore, there are areas of educational cost in which school finance people seem reluctant to deal. One reason is that these subjects have long been debated with little agreement, while another is that school (and governmental) accounting and principles have developed historically along lines separate from those of industry.

In the past attempts to apply industrial techniques to school management were often misunderstood and nearly always opposed by administrations and publics. However, it has become increasingly necessary, under the influence of accountability, to integrate more sophisticated management techniques into the educational structure to deliver promised program results.

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[3] Samuel B. Tidwell, *Financial and Managerial Accounting for Elementary and Secondary School Systems* (Chicago: Association of School Business Officials, 1974).

For accountability purposes, states must address the questions of definitions and strive for uniformity in reporting fiscal data. The recommendation herein is that all costs reasonably identifiable with a given action be included in the definition of "costs" for accountability purposes.

Cost vs. Expenditure

With few exceptions, the majority of educational accounting systems are expenditure reporting systems. Industry cost systems, which consider inventories, depreciation, and accruals, attempt to report true costs. Educational accounting systems have no provisions for the allocation of overhead or burden costs. They are, in that sense, only capable of reporting expenditures directly against a specific activity and object.

In order to provide ways for educators to express costs (and savings) incurred by accountability, but not identifiable in a strictly "direct expenditure" system, this model has included an object of expenditure named "Imputed Costs."

Imputed Costs

Imputed costs are defined as ones which result from the difference between two alternative methods of procuring income or expending funds--what might have been done as opposed to what actually was done. Included for the purposes of the model are the following:

(a) Opportunity Costs - The costs of not following a more advantageous alternative

(b) Foregone Costs - The costs which have been lost due to the abandonment of a course of action or the failure to maximize upon a possibility

While imputed costs are not legitimate for accounting statement purposes, these unrecorded costs are significant expenditures.

Hidden Costs

Another facet of the cost of educational programs in an accountability oriented school structure is those support costs (called hidden costs) which may generally be absorbed by a supporting section, such as a publication section or an accounting section. It is important that these costs be identified and budgeted; otherwise, the resources may not be available when they are needed. When a limited staff is assigned to the accountability function, these costs may prove to be a significant part of the total cost.

Stage 4: An Identified Set of Management Costing Tasks

Worksheets. The educational program manager begins the accountability costing tasks with a planning process which includes the stating of goals, objectives, activities, and tasks arranged in the hierarchical arrangement discussed earlier in the chapter. The structure for this process is a series of three sequential Worksheets shown in Exhibit 1, "Planned Worksheet," Exhibit 2, "Plan/Budget Worksheet," and Exhibit 3, "Support Required Plan Budget Worksheet."

Exhibit 1

Plan Worksheet

Index				
Goal	Terminal Objective	Category	Mission Details	Component
			Goal	
			Terminal Objective	

			Activity Plan	Responsibility	Component

Exhibit 2

Plan/Budget Worksheet

Index										
Goal	Terminal Objective	Category	Component	Mission Terminal Objectives				Responsibility		
				Activity/Task	Due Date	Personnel and Material	Time (Days)	Object	Material Cost	Support Required

Exhibit 3

Support Required Plan/Budget Worksheet

Index				Activity	Initiating Unit	Receiving Unit
Goal	Term. Obj.	Category	Component		Initiated by: Approved by: Transmitted to: Date:	Received by: Date Received by: Approved by: Date Assigned to:
SUPPORT SERVICE TASK AND RESOURCE REQUIREMENTS						
Support Tasks	Date Due	Personnel and Material	Time (Days)	Object	Material Cost	Funding

Exhibit 1 serves as the basis from which Exhibits 2 and 3 are developed.[4]

In Exhibit 1 objectives must be identified with the category of cost and assigned to the particular party or parties with overall responsibility (e.g., department, university, division, etc.). A separate worksheet would be used for each terminal objective. Next, activities are defined by component and specific responsibility (e.g., teacher, principal, or finance officer). Using the coding structure found in the previous section of this chapter, "Development of a Framework for Coding," the codes for each level are then applied.

After stating the plan to the activity level, one must begin to itemize the specific action referred to as "Task." As each task is considered, the date of "Required Completion" (due date) should be specified. By setting the due date for each objective and examining the relationship between activities, an activity due date can be computed; by examining task relationships, the task due dates can be established.

Depending upon the complexities of the particular objective, it may be desirable to utilize a sophisticated program management technique such as Program Evaluation and Review Techniques (PERT), the Critical Path Method (CPM), or the Line of Balance (LOB).

At the task level, one must identify resources in terms of manpower and material requirements. Manpower time, in terms of working days, helps to determine personnel and related costs, while material type and quantity can be directly costed. These objects of expenditure costs can then be aggregated to supply the costs of objectives. In addition, it will be possible to identify specialized support required for each task and to provide for those costs to be included.

Whether one thinks in terms of tasks as being learning tasks toward achievement of learning objectives or functional tasks toward operational objectives, the cost significance is in terms of those "things" needed to accomplish the task. Thus, Object of Expenditure becomes the common ground between the two very different kinds of tasks. In a similar way Category of Cost and Component Cost become the common ground between Objectives and Activities respectively. This structure of accountability objectives is shown in Figure 4.5. With this in mind, it becomes possible to generalize a cost model regardless of the type of objectives in question.

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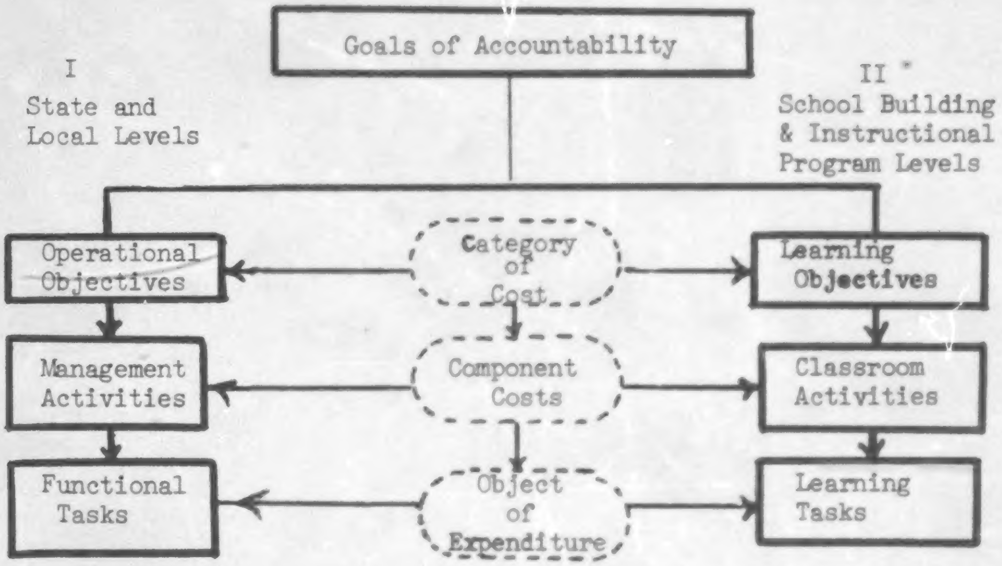
[4] These worksheets can be used by the administrators as one management mechansim to answer a number of questions frequently asked about accountability, namely "Accountability - under what conditions? To whom? By whom? For what actions and outcomes? To what degree? Over what period of time? At what cost?"

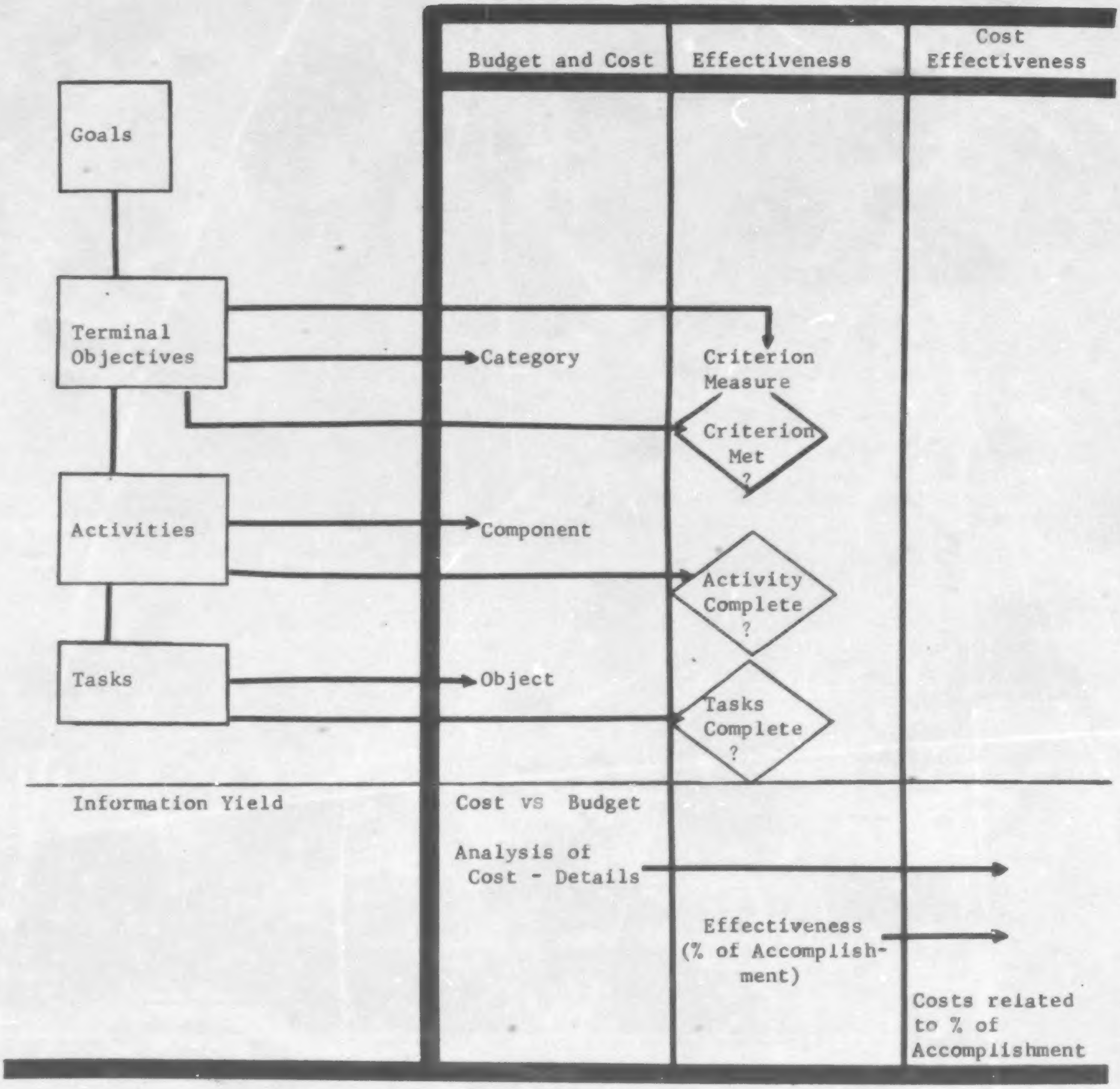
Figure 4.5 Structure of Accountability Objectives


Goals of Accountability
I
State and
Local Levels
II
School Building
& Instructional
Program Levels
Operational
Objectives
Category
of
Cost
Learning
Objectives
Management
Activities
Component
Costs
Classroom
Activities
Functional
Tasks
Object
of
Expenditure
Learning
Tasks

Stage 5: A Generalized O-R Program Cost Model

The Model's Functional Elements. Figure 4.6 shows the relationships between the functional element statements (goal, terminal objective, activity, and task) and their resultant information yield in the model.

Figure 4.6 Accountability Action Plan/Budget Model


Budget and Cost
Effectiveness
Cost Effectiveness
Goals
Terminal Objectives
Category
Criterion Measure
Criterion Met ?
Activities
Component
Activity Complete ?
Tasks
Object
Tasks Complete ?
Information Yield
Cost vs Budget
Analysis of Cost - Details
Effectiveness (% of Accomplishment)
Costs related to % of Accomplishment

The flow of the relationship between the functional element statements and their resultant information can be expressed as follows:

- Goals - yield general directions. Terminal objectives are a natural outcome of goals.
- Terminal Objectives - yield specific directions and criterion reference for goal achievement. Activities are derived from the terminal objectives.
- Activities - yield details of action and responsibilities. Tasks are a finer detail activity.
- Tasks - yield specific operations and resource requirements which, in turn, are a statement of object budget items. Once in operation, task completion data begin the evaluation cycle and yield data about activity completion and actual object cost data.
- Evaluation - can only occur when task and activity are complete. The terminal objective criterion is applied, and the percentage of achievement is determined.
- Budget - object budget data are derived from task resource requirements and, in turn, yield object and component budget at the activity level. Activity level budget data yield terminal objective budget data by object, component, and category as well as terminal objective and goal.
- Cost - put into operation, the accountability action plan budget cost is captured in the same manner as the budget data.
- Cost Effectiveness - can only be derived when task and activity are complete, the criterion has been applied, and the cost has been captured.

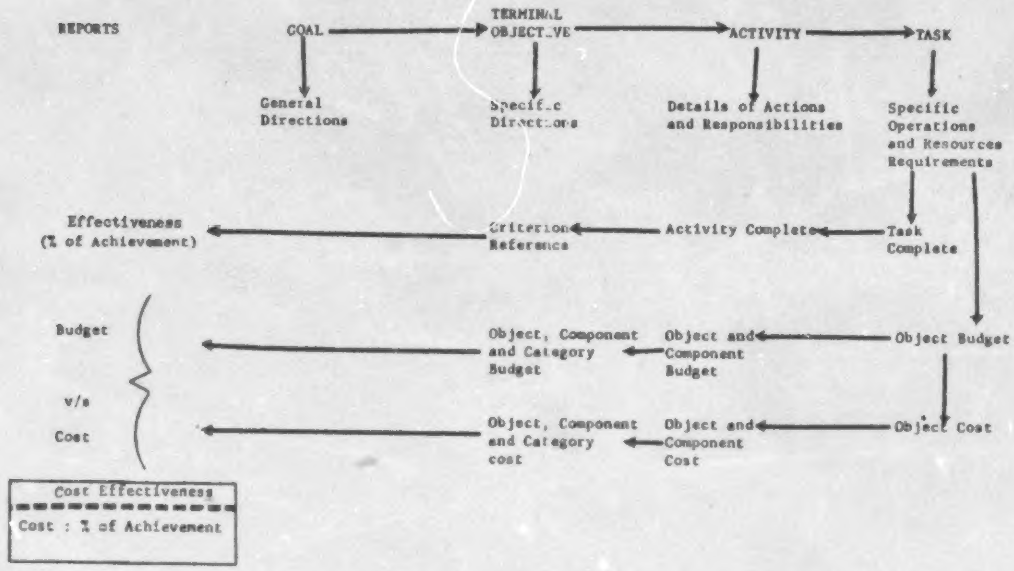
Inherent Information Flow in an O-R Program Cost Model. The model addressed in the previous section can be generalized to an administrative and instructional plan for accountability. It is also flexible in that additional layers of elements (objectives) and cost coding (i.e., fund, fiscal year, etc.) can be superimposed over the basic layers as stated.

The basic assumption underlying the model is that the cost of an objective can be derived from the cost of objects of expenditure which occur at the task level. The cost of tasks and activities are only important to accountability cost in that they yield the object, component, and category costs of an objective.

Adaptation of the model presumes that a financial reporting system capable of absorbing the necessary coding system exists within the model framework.

Figure 4.7 is a restatement of the model with its inherent information flow.

Figure 4.7 Action Plan/Budget: Objective, Activity, Task Flow Details


REPORTS
GOAL
TERMINAL OBJECTIVE
ACTIVITY
TASK
General Directions
Specific Directions
Details of Actions and Responsibilities
Specific Operations and Resources Requirements
Effectiveness (% of Achievement)
Criterion Reference
Activity Complete
Task Complete
Budget
v/s
Cost
Object, Component and Category Budget
Object and Component Budget
Object Budget
Object, Component and Category cost
Object and Component Cost
Object Cost
Cost Effectiveness
Cost : % of Achievement

Summary

Cost in this monograph is viewed as a measure of the resources that go into educational programs. Effectiveness measures what comes out. Cost-effectiveness equates expenditures with results. The true test of the O-R Program Cost Model will be its ability to produce cost/effectiveness data which will aid boards of education and state, local, and school administrators in making critical priority decisions about how scarce dollars will be spent, which programs will live, which programs will die, and where expansion and reductions will take place.

Chapter IV discussed the essential elements in a blueprint for an O-R Program Cost Model. These elements include: (1) a framework for cost coding; (2) the significant levels and type of cost collection; and (3) the accountability cost task. The output of these dimensions, once computerized, will yield some clean program cost/effectiveness data. This framework provides the basis for the program applications to be discussed in the ensuing chapters.

CHAPTER V

ADAPTION OF THE O-R PROGRAM COST MODEL AT THE STATE LEVEL

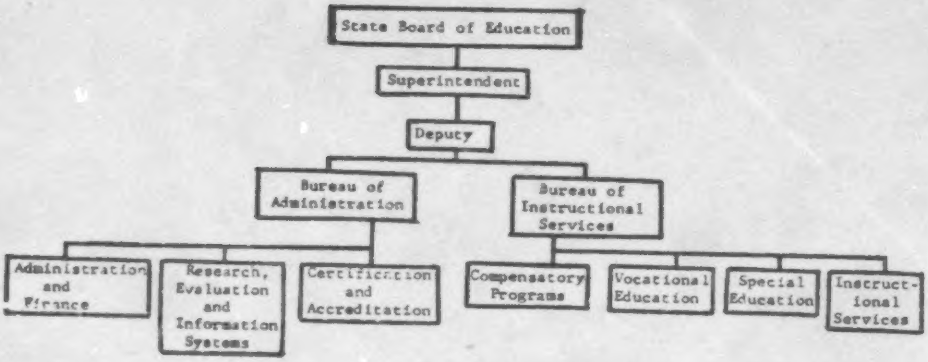
Chapter Objectives

- To identify the two types of educational management structures operating within the Maryland State Department of Education
- To describe two educational management structures
- To cite differences between the educational management structures
- To provide background to the Maryland State Department of Education management restructuring
- To identify the elements of the "Applied Plan Worksheet"
- To identify the elements of the "Applied Plan/ Budget Worksheet"
- To identify the elements of the "Applied Support Services Plan/Budget Worksheet

Educational Organization and Objective-Referenced Structures

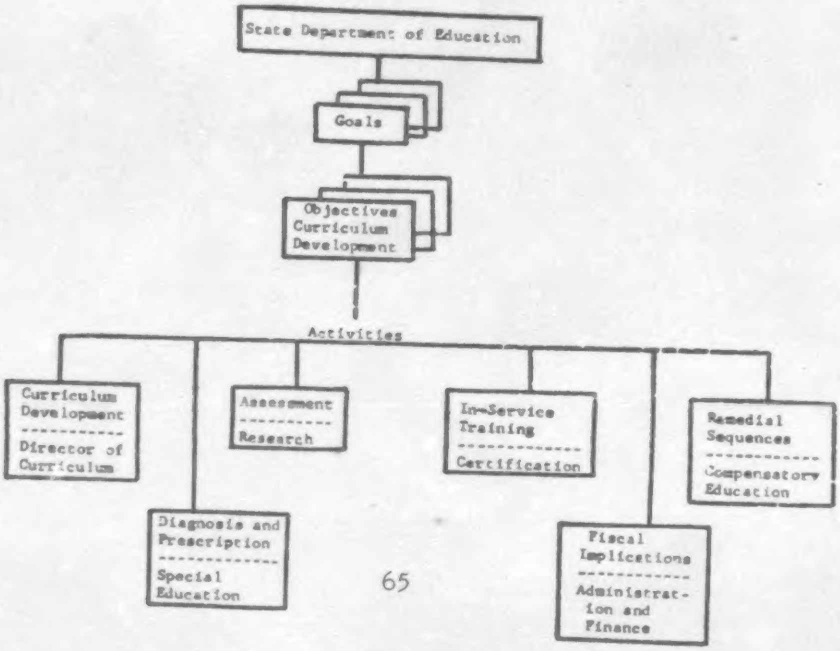
Traditionally, state departments of education are involved in viewing cost data along organizational lines, symbolized by the old top-down, hierarchical structure of industry. Organizations grew up around activity groupings which required like disciplines. Department objectives, which were both formally and informally stated, related to the particular segment of the organization. For example, an objective related to evaluating a particular instructional program would be relegated to the Research Division, while development of instructional programs would be assigned to the Division of Instruction. Figure 5.1 provides an illustration of a state department of education organizational structure. In this arrangement, there is little cross-divisional contact except by mutual agreement of the parties.

Figure 5.1 A State Department of Education Organizational Structure


State Board of Education
Superintendent
Deputy
Bureau of Administration
Bureau of Instructional Services
Administration and Finance
Research, Evaluation and Information Systems
Certification and Accreditation
Compensatory Programs
Vocational Education
Special Education
Instructional Services

Accountability is changing the way educational managers view objectives, as well as the cost data. Figure 5.2 shows a state department of education using an objective-referenced structure. Goals and objectives are more formally stated and they are viewed on a system level. Objectives are stated so that the prime responsibility rests with a single unit or individual; however, that party often calls for support and involvement across divisional lines. An objective dealing with the program development may be assigned to the director of curriculum; however, that person may call for research input to develop assessment instruments, certification input for teacher training, compensatory program input for the development of remedial sequences, and fiscal input from administration and finance.

Figure 5.2 A State Department of Education Objective Referenced Structure


State Department of Education
Goals
Objectives Curriculum Development
Activities
Curriculum Development
Director of Curriculum
Assessment
Research
In-Service Training
Certification
Remedial Sequences
Compensatory Education
Diagnosis and Prescription
Special Education
Fiscal Implications
Administration and Finance

The State of Maryland began making the transition from a traditional organization structure to an objective-referenced structure in 1972 when a management-by-objectives philosophy was introduced. The introduction of MBO was followed by the first attempt at a program budget. By 1974 the Department was operating with its first program plan.

When the State government decided to adopt statewide program planning, the Maryland State Department of Education was well ahead of the game. The Fiscal Year 1977 budget which is being developed at the time of this writing (1975) will reflect the fourth year of objective-referenced management. It is the first year that the Department is looking at its operation by major functions across divisional lines, and it is hoped that this new method of viewing departmental operations will find its way into the budget presentation to the State legislature.

Following the passage of accountability legislation by the 1973 General Assembly and an abortive attempt to attain an accountability structure, the Maryland State Department of Education established an Office of Accountability, manned by a coordinator and a staff specialist. With a very low budget, limited manpower, and a herculean task, it was quickly recognized that the accountability staff needed to be augmented with additional manpower with particular expertise in subject matter, assessment, evaluation, public relations, planning, finance, and administration. An accountability team was created by identifying individuals with the required discipline skills and by allowing the Office of Accountability to call for up to 50 percent of the individual's time to be devoted to accountability. The necessity for sophisticated project management was incumbent upon the Accountability staff. Objectives were established for the team members, and project plans were developed. Critical Path Method (CPM) was utilized to assure deadlines. The Department met its first year's deadlines due, in no small part, to the application of these techniques.

For Fiscal Year (FY) 1976 the Department intends to add both a refinement and expansion phase to the existing accountability system operating in Maryland. In the refinement phase, for example, focus is given to the implementation of the systems based upon student-oriented goals and objectives by which program planning is determined on the basis of measurable student progress and program cost/effectiveness. In the expansion phase, 15 major activities would be incorporated into the accountability structure ranging from "monitoring of the assessment program" to "research and piloting a program oriented toward establishing minimum expectations for subject areas and grade levels" and, finally, the "extension and refinement of the program cost analysis component." The breadth and depth to the present system is a necessity if a totally comprehensive system is to achieve a steady state of operation in Maryland.

While Maryland's prime subject matter in this monograph is accountability costs, other areas within the State Department of Education will be following along a similar pattern. Most notable of these is Special Education for the

Handicapped. Following a new legislative mandate and a court decree,[1] the Department organized a new Division of Special Education which is charged with the task of implementing free educational programs for all handicapped children in the State. This task not only crosses divisional lines within the Maryland State Department of Education but also involves numerous other State agencies and institutions, as well as special interest groups.

A strictly organizational approach to management in either accountability or special education would have been too narrow a focus for understanding the complexities involved in program administration at the State level. The organizational approach would not provide for the agreement, responsibilities, and working relationship among departments (divisions) on specific programs. On the other hand, an objective-referenced approach tends to cover such intricate organizational arrangements by defining the structure in such a way that statements of intended actions, responsibilities, and resource requirements are clearly understood by all concerned parties. Failure to live up to agreed-upon responsibilities toward completion of designated program objectives then can be checked, and the fulfillment or nonfulfillment of accountability requirements can be handled.

The next section of this Chapter uses the Maryland Accountability Program as its primary example upon which an O-R program cost model is applied. However, the information inserted into the "Plan Worksheet," "Plan/Budget Worksheet," and the "Support Required Plan/Budget Worksheet," is merely illustrative rather than actual.

An Applied Plan Worksheet

In Chapter 4 a "Plan Worksheet" was introduced to provide for a uniform statement of objectives, activities, and tasks with assignment of responsibility. In this Chapter, suppositional information on the Maryland Educational Accountability Program has been inserted into Figure 5.3, a sample "Plan Worksheet" shell.

This "Plan Worksheet" is broken down into three parts, namely: (1) Mission Details; (2) Level of Responsibility; and (3) Code Indices.

---

[1] Maryland Association for Retarded Citizens vs. State of Maryland, et. al.

Figure 5.3 Sample Plan Worksheet

Index			Mission Details		Component
Goal	Terminal Objective	Category			
01			**Goal** To provide for the establishment of a statewide accountability program		
01	01		**Terminal Objective** To develop and implement a program of statewide accountability to meet the mandates of the Educational Accountability Law		
			Activity Plan	Responsibility	Component
01	01	01	Establish decision-making teams to administer the Accountability Program	Office of Accountability	05
01	01	01	Develop and establish a State Plan for Accountability	Office of Accountability, Office of Planning Division of Research, Evaluation, and Information Systems	05
01	01	01	Develop and establish SEA Objectives	All SEA Divisions	05
01	01	01	Develop and establish Statewide Goals and Objectives	Office of Accountability, Division of Instruction	05-07
01	01	01	Develop and implement the Assessment Component to the Maryland Educational Accountability Program	Division of Research, Evaluation, and Information Systems	06
01	01	01	Prepare Educational Accountability Report to Governor	Division of Research, Evaluation, and Information Systems--Office of Accountability	05-06
01	01	01	Develop and implement Criterion-Referenced Instruments	Division of Research, Evaluation, and Information Systems--Division of Instruction	06
01	01	01	Develop and implement procedures for establishing the costs of instructional programs	Division of Administration and Finance	05

Worksheet Procedure

Mission Detail:	The program administrator or manager (1) specifies the particular statewide goal to be achieved, (e.g., to provide for the establishment of a statewide accountability program as set forth in Chapter 1; (2) states a terminal objective which the state educational agency must accomplish; and (3) identifies those activities necessary to accomplish the terminal objective.
Level of Responsibility:	The program administrator identifies those organizational bodies responsible for completing a particular activity or set of activities. Here responsibility is contingent upon a hierarchy of agreements and levels of cooperation reached within the SEA.
Code Indices:	The program administrator assigns a code structure to both Mission Details (i.e., Goals, Terminal Objectives, and Activity via the Category of Cost, and the Level of Responsibility via Component).

An Applied Plan/Budget Worksheet

The Maryland State Department of Education began using a worksheet in its budget process in 1974. That worksheet combined the plan statement mentioned in the previous section with the detailing of resource requirements and was referred to as a "Plan/Budget Worksheet." Figure 5.4 provides a sample of this "Worksheet," again using suppositional information of the Maryland Educational Accountability Program.

Figure 5.4 Sample Plan/Budget Worksheet

Index				Mission		Object		Responsibility			
Goal	Terminal Objective	Category	Component								
01	01	01		Terminal Objective	To develop and implement a program of Educational Accountability for the State in order to meet the mandates of the Educational Accountability Act						
				Activity/Task	Start Date	End Date	Personnel and Material	Time (Days)	Object	Material Cost	Support Required
01	01	01	06	Prepare an Accountability Report	4/74	-					
06	01	01	06	Contract with outside firm	4/74		Division of Research and Evaluation				
				o Write RFP	4/74	4/74	" "	10			
				o Accept Proposals and Bids	4/74	5/74	" "	20			
				o Select Firm	5/74	5/74	" "	5			
01	01	01	06	Project Initiation	5/74		Contractor, e.g., Project Director, Division of Research and Evaluation				
01	01	01	06	Monitor Contract	5/74	-					
01	01	01	06	Prepare Chapters for Report	7/74	-	" "				
				o Write Introduction	7/74	7/74	" "	6			
				o Write SEA Objectives	7/74	8/74	" "	10			
				o Write Accountability Information: State Level Goals	8/74	8/74	" "	27			SEA Staff Div. Instr. Staff
				o Write Accountability Information: Local School System and Individual School Level	6/74 8/74	10/74 10/74	" " Travel Meals " "	30 12	.04 .03	$120 $100	Data Processing
				o Write Technical Information	8/74	10/74	" "	18			Coordinators of Accountability
				o Have LEA Prepare Narrative on Local School system results	8/74	9/74	" "	16			
01	01	01	06	Complete Draft Accountability Report	11/74	11/74	" "	3	.02	20,000	
				Prepare camera-ready copy of Accountability Report			Contractor				

The "Plan/Bduget Worksheet" is divided into two parts. The first part of the Worksheet is a statement of the terminal objective, the index coding, and the responsibility section. These data would appear exactly as on the "Plan Worksheet." The second part is devoted to a detailed statement of the plan and a compilation of the resource requirements.

Worksheet Procedure

Goal:	Restate the statewide goal found in the "Plan Worksheet."
Terminal Objective:	Restate the Terminal Objective found in the "Plan Worksheet."
Activity:	Restate all activities needed to complete the Terminal Objective.
Task:	State all salient tasks needed to complete each stated activity. Each task should have enough details to include all necessary resources needed to complete the task. For example, it may be adequate to say "Disseminate Plan Requirement," but preferable wording would be "Print and mail 1,000 copies of the Plan Requirements." From the latter statement, it is obvious that printing and mailing costs are involved, while the former statement needed additional information to determine resource requirements.
Dates:	Dates (Start/End) should be inserted for each activity/task stated. Dates have a direct effect on manpower and resource requirements.
Personnel/Material:	List the title of the person(s) on the payroll who will be involved in this task. Also state those non-payroll resource requirements (i.e., printing costs). Employment of consultants not on the payroll should be detailed here.
Time:	Include the number of days (man-days) that the personnel listed in the previous column will be actively involved in this task. Include only personnel who are on the payroll. Do not include time for outside consultants. Two hundred (200) days per year is a reasonable bench mark for assigning professional personnel to detailed tasks. Therefore, any assignment of a single position beyond 200 days would be an indication that additional personnel are required.

Object:	Refer to the "Object of Expenditure Codes" and code each non-payroll item listed in the "Personnel and Material Column."
Material Cost:	Estimate the cost of each non-payroll item listed in the "Personnel and Material Column."
Support Required:	When support is required from a unit in another jurisdiction area, write the name of that unit in this space. Then complete a "Support Required Plan/Budget Worksheet" and forward it to that unit.

An Applied Support Services Plan/Budget Worksheet

The Maryland State Department of Education also realized the need to identify requirements for supporting services and to set procedures for request and approval of such requirements. A comparison worksheet was prepared and remains in current use. This form is called the "Support Required Plan/Budget Worksheet," as shown in Figure 5.5.

The hypothetical information supplied on this worksheet is again applied to the Maryland Accountability Program.

The "Support Required Plan/Budget Worksheet" is designed to make specific statements of support activities which formerly were hidden from view, absorbed in other cost activities, or forgotten in the planning process. Often the need for such support services is not recognized until the time that they are required. Since they have not been includes in the planning process, such support services are either unavailable or available only at a much higher cost. They often cause a hardship on the suppliers and bring about the disruption of services to other areas.

This worksheet must detail the entire support services necessary to accomplish each activity and communicate the desire for these support services to the necessary authority which is responsible for furnishing such services.

Worksheet Procedures

Initiating Unit:	The unit responsible for the prime activity should initiate this form by first copying the "Index" from the "Plan/Budget Worksheet" and then briefly describing the activity for which this support service is required. The initiator should sign the form and have it approved by his immediate superior who, in turn, should note to whom the form is being transmitted and the date of transmittal.

Figure 5.5 Sample Support Required Plan/Budget Worksheet

Index				Activity	Initiating Unit	Receiving Unit
Goal	Term. Obj.	Category	Component			
01	01	01	06	**Prepare Chapters for Accountability Report**	Initiated By: ________ Approved By: ________ Transmitted To: ________ Date ________	Received By: ______ Date ____ Received By: __________ Approved By: ______ Date ____ Assigned To: __________

SUPPORT SERVICE TASK AND RESOURCE REQUIREMENTS

Support Tasks	Start Date	End Date	Personnel and Material	Time (Days)	Object	Material Cost	Funding
Write Objectives for State Educational Agency	7/74	8/74	Staff Member from each SEA Division	3	01		
Statewide Workshop on Writing Goals and Objectives	7/74	7/74	Director of Accountability, Consultants (2) Workshop Housing and Meals		02 03	$270 $350	Title V
Write Accountability Information i.e., Statewide Goals	8/74	8/74	Staff Members of Division of Instruction/ LEAs	5	01		
LEA Prepares Narrative on Local School System Goals, Objectives, and Assessment Results	8/74	9/74	Local Coordinator of Accountability in 24 Local School Systems	5	01		

Receiving Unit:	The receiving unit should note the receipt of the form and date. The form should then be reviewed with the initiating unit to be sure that the activity and support service is completely understood. At this time the receiving unit should fill in the "Support Tasks Section." After review with the receiving unit, the receiving unit should note the approval or disapproval of this support service, the date, and the specific individual responsible for seeing that the service is provided.
Support tasks:	Each support task needed to complete the terminal objective is stated. For each support task identified, the responsible administrator must enter the due date, type of personnel and material used, the time (in days) the personnel or material have been used, and the object material cost and funding source.

Management control, under the "Request for Support" via this worksheet, must be exercised so that once a receiving unit approves the support required, the receiving unit is required to furnish the services. Should it become impossible, due to budget cuts or other reasons, for the receiving unit to furnish the support service, it will be the responsibility of the receiving unit to advise the initiating unit that such is the case. Should a receiving unit be in default in providing the support services, it is the responsibility of top management to provide the appropriate remedies to see that the initiating unit is not penalized. Should any disagreement arise between the two units, management must provide for necessary arbitration. Any failure of management to firmly support this procedure will negate the ability of these procedures to function effectively.

Summary

One of the most frequent questions asked about accountability is: "How much does it cost?" The cost of accountability generally will vary with the activities involved in the accountability process. These activities are directly controlled by the accountability law. In Maryland, a major cost of accountability is related to testing, but a perhaps equal cost, yet more difficult to measure, was the cost of developing goals and objectives and the preparation of the Maryland Accountability Report. At the State level we generally think of the cost incurred by the State Department of Education. Salary cost, such as for the Administrator of Accountability and his assistant, is easily identifiable within the accountability process. However, the greater cost of time spent by the various educational specialists who work in other areas of the State Department is often overlooked. This discrepancy can be multiplied 24 times when dealing with the local school systems and additionally multiplied again by the number of schools in each system for the involvement of principals, teachers, and other school base personnel. A system of planning and estimating requirements becomes very necessary in dealing with all these costs at different levels.

CHAPTER VI

ADAPTATION OF THE O-R PROGRAM COST MODEL TO A LOCAL EDUCATIONAL AGENCY

Chapter Objectives

- To identify fiscal opportunities to which the model can be applied
- To state an approach to your opportunity in terms of terminal objectives
- To develop LEA Sample Worksheets for terminal objectives in the LEA program area of Educational Accountability Assessment
- To evaluate the cost data and compare projected costs to actual costs
- To capitalize upon the fiscal opportunities

Chapter VI contains the rationale for utilization of the Objective-Referenced Program Cost Model at the local educational agency (LEA) level. The model will be set forth for LEA management as well as for accountability purposes.

The fiscal management needs of LEA's, formerly dictated largely by local personnel, are increasing rapidly due to economic conditions. The Objective-Referenced Program Cost Model provides a method for accumulating the cost of exactly the one objective the individual is attempting to evaluate. Thus, through the model, management has a tool for control and analysis of costs and the opportunity to improve its fiscal effectiveness.

In this chapter the O-R Program Cost Model is applied to three LEA-oriented fiscal opportunities. Fiscal opportunities are those situations wherein management, by utilizing planning and analysis techniques, can contribute to the operation and effectiveness of educational programs. The first fiscal opportunity briefly describes the case whereby the model was applied to the area of special education programs. The second fiscal opportunity most germane to this publication applies the O-R Program Cost

Model to the theoretical treatment involving the development and implementation of an LEA assessment program initiated to meet the mandates of an Educational Accountability Act. Finally, in an entirely different case, an LEA uses the O-R Program Cost Model as a means for selecting the most cost-effective product from several different reading curriculum packages for children with the same ability levels and at the same grade level.

The reader will soon realize that the O-R Program Cost Model is adaptable to a variety of LEA situations. The application of the model to fiscal opportunities, however, is limited only by the ability of the user to handle the volume of work required. Given capable staff and computer facilities, the model could be applied to most costing and budgeting within an organization. On the other hand, the model as demonstrated in Fiscal Opportunity III is equally applicable to some isolated area of cost concern.

Fiscal Opportunity I

Special Education

In Maryland the model was applied to special education planning at the local levels for Fiscal Year 1976. Legislation and a landmark court decree[1] in 1972 called for a drastic increase in special education services for the five-year period, 1973-1978. Since funds at the State, local, and federal levels are generally very sparse for such momentous undertakings, an objective-referenced approach to planning and budgeting could fill the necessary requirements of management.

The State Department of Education developed a check list of programmatic demands against which an LEA could evaluate its capabilities. Each programmatic need thus identified was translated into an objective statement and assigned a priority in terms of the five-year planning cycle. A "Plan/Budget Worksheet" then was developed for each objective. When the total local plan was compiled, it could be evaluated for total fiscal capability, and priorities could be adjusted before forwarding the plan to the State for approval.

Fiscal Opportunity II

Local School System Assessment Program in an O-R Program Cost Model Context

In this case study the Local School System is involved in implementing an assessment program to meet a mandated State Accountability Program. The specific goals, objectives, and other cost-related information are placed into the context of the O-R Program Cost Model.[2]

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[1] Maryland Association for Retarded Citizens vs. State of Maryland, et. al.

[2] Here again, only suppositional information is used for Fiscal Opportunity II in Figures 6.1, 6.2, and 6.3.

Figure 6.1 presents a completed "Sample Plan Worksheet" with the LEA school system terminal objective of developing and implementing an assessment program using the *Iowa Tests of Basic Skills* and the *Cognitive Abilities Tests* to be given to all pupils in grades 3, 5, 7, and 9. The "Activity Plan" section identifies activities needed to complete the terminal objective. These activities range from determining the local plan for assessment of pupil performance to disseminating results to various audiences. The section labeled "Responsibility" answers the question, "Who is responsible for what activity?"

Figure 6.2 shows a completed "Plan/Budget Worksheet." Again, much of the information from the "Plan Worksheet" is transferred to the "Sample Plan/Budget Worksheet" by the administrative fiscal officer. When the reader gets to the section labeled "Activity/Tasks on the "Plan/Budget Worksheet," all major activities and tasks related to the terminal objective should be stated. In Figure 6.2, however, only a few activities taken from the "Sample Plan Worksheet" are cited to give the reader some flavor of what needs to be done to complete the entire "Plan/Budget Worksheet," including those sections labeled "Due Date," "Personnel and Material," "Time," "Object," "Material Cost," and "Support Required" respectively.

Figure 6.3 is a "Sample Support Required Plan/Budget Worksheet," showing in the upper section (1) the specific activity of the terminal objective needing additional support under another division in the LEA; (2) the unit initiating the support need; and (3) the unit providing the support.

The lower section of Figure 6.3 provides other detailed information related to (1) specific tasks to be completed by the support division, (2) due date, (3) support personnel and materials needed to complete the activity, (4) time (days), (5) object, (6) material cost, and (7) source of funding.

Figure 6.1 Sample Plan Worksheet

Index				
Goal	Terminal Objective	Category	Mission Details	Component
01			**Goal** To develop and implement an assessment program at the local school system level to meet the mandates of the Educational Accountability Law and the requirements of the State Plan for Educational Accountability.	
01	01		**Terminal Objective** By March, 1974 develop and implement an assessment program using the Iowa Tests of Basic Skills (ITBS - 1971 edition, Form 5) and Cognitive Ability Test (CAT - 1971 edition, Form 1) that would be given to all pupils in grades 3, 5, 7, 9.	

			Activity Plan	Responsibility	Component
01	01	01	. Determine local plan for assessing pupil performance	Center for Planning, Research, and Evaluation	01
01	01	01	. Determine number of schools and number of students that will be included in the assessment program	Center for Planning, Research, and Evaluation	01
01	01	01	. Procure tests, practice tests, answer sheets and related test material	Center for Planning, Research, and Evaluation	01
01	01	01	. Develop materials for orientation and training	Center for Planning, Research, and Evaluation	01
01	01	01	. Conduct orientation and training sessions for MAAP School Test Coordinator and alternate the Maryland Accountability Assessment Program	Center for Planning, Research, and Evaluation	01
01	01	01	. Operationalize the local assessment program	Center for Planning, Research, and Evaluation	01
01	01	01	. Conduct data processing	Educational Data Processing Center	01
01	01	01	. Conduct data analysis	Center for Planning, Research, and Evaluation	01
01	01	01	. Write report	Center for Planning, Research, and Evaluation	01
01	01	01	. Disseminate results to various audiences (i.e. Public, Local School Board, Local Schools, etc.)	Center for Planning, Research, and Evaluation	01

Figure 6.2 Sample Plan/Budget Worksheet

Index				Mission		Responsibility
Goal	Terminal Objective	Category	Component			
01	01	01	01	Terminal Objective	Develop and implement assessment program using ITBS and CAT for pupils in grades 3, 5, 7, 9.	Center for Planning, Research, and Evaluation

				Activity/Task	Due Date	Personnel and Material	Time (Days)	Object	Material Cost	Support Required
01	01	01	01	Purchase Assessment Instruments	11/30/73	ITBS Tests	-	03		
						ITBS Practice Test	-	03		
						Answer Sheets	-	03		
						CAT Test	-	03		
						CAT Practice Test	-	03		
						Answer Sheets	-	03		
						Total	-	-	$9,000	-
01	01	01	01	Conduct Data Processing	6/20/74	Computer usage	2	03		
						Total			$1,500	Ed. Data Processing Center

Figure 6.3 Sample Support Required Plan/Budget Worksheet

Index				Activity	Initiating Unit	Receiving Unit
Goal[1]	Terminal Objective	Category	Component			
01	01	01	01	Conduct Data Processing of Assessment Program Information	Initiated By: Director CPRE Approved By: Asst. Sch. Super. Transmitted To: Date: 6/23/74	Received By: IWH Date: 7/3/74 Received By: Approved By: RCA Date: 7/3/74 Assigned To:

SUPPORT SERVICE TASK AND RESOURCE REQUIREMENTS

Support Tasks	Date Due	Personnel and Material	Time (Days)	Object	Material Cost	Funding
Write computer program		Computer Programmer	4	.02(Tests)	$200	General
Use of optical scanning device		Specialist II	1	.04(Forms)	$120	"
Key Punch operation		Key Punch Operator	3	.02(Machine Time)	$ 60	"
Computer Processing		Operation's Personnel	2	.02	$960	"

Fiscal Opportunity III

Alternative Reading Programs

In an entirely separate situation, one local agency recognized that an opportunity existed to consolidate educational programming and thus save costs and simplify its instructional program. The LEA was then using several different reading curriculum packages for the same grade and ability level. If a method were available to evaluate the different packages for cost and effectiveness, then the LEA could use the best package and save on the elimination of the others. In this model's application, the physical opportunity began with defining the administrative objectives. Next, an action plan was developed to organize the activities and tasks, including the development of classroom objectives for each package. (Classroom objective planning is described in Chapter VII.)

Writing Opportunity-Oriented Terminal Objectives

There is no real difference between the opportunity-oriented terminal objective and any other type of terminal objective. Any differentiation is made by the attitude in which the objective is conveyed. Searching for positive improvement in fiscal and operational practices remains the goal toward which the model is applied. The objective must convey the reason that the objective is being approached, the expected outcomes, the criteria by which to judge the outcomes, the individual responsible for the total objective, and the schedule for completion.

It is usually easiest to clarify the objective by stating the opportunity in terms of its problematic or situational aspects. For example:

> Problem Description - We are currently using as many as seven different reading curriculum packages in the elementary setting, and several packages address the same ability level. There is a marked difference in the costs of the packages, and it is difficult to determine which packages are producing the best results. It is not possible, with present data, to determine whether the cost of the higher-priced packages is justified.
>
> Opportunity - To improve the reading program by identifying the most effective packages, to consolidate costs, and to justify the different level of expenditures in terms of cost and effectiveness.
>
> > Objective 1 - By September, 1975, the Division of Research shall identify and/or develop a research and evaluation design to measure the effectiveness of elementary reading packages in terms of time and skill achievement.

Objective 2 - By August, 1975, the Division of Instruction shall have written classroom objectives for the reading packages at each level of ability and shall have communicated these to each teacher.

Objective 3 - By September, 1975, the teacher in each elementary school shall have prepared a Plan/Budget Worksheet for each reading objective.

Objective 4 - By October, 1975, the Office of Budget and Planning, using the teacher Plan/Budget Worksheet, shall have projected the cost of each objective for each package and shall have prepared a projected analysis for dissemination.

Objective 5 - By the tenth of each month, during school year 1975-76, the Office of Accounting shall produce actual cost reports for each package--for each objective, showing actual projected costs.

Preparation of a Plan/Budget Worksheet

Preparation of the Plan/Budget Worksheet for the administrative objective is described in Chapter IV, while the Instructional Plan/Budget Worksheet is described in Chapter VII.

Particular attention should be placed on the time dimension. As new activities and tasks are discovered, they should be added to the worksheet and appropriately scheduled. Those activities and tasks which become unnecessary should be deleted. The original and the final worksheets should be saved for comparison to give insights for future projects.

Collecting Actual Cost Data

If an adequate accounting system already exists in the local agency, the additions of the model codes and subsequent cost collection become routine. The volume of data will depend upon the complexity and extensiveness of the problem/opportunity being observed. One should determine whether the local system is capable of handling the projected volumes before starting, or serious difficulty and probable failure will result.

A sophisticated accounting system is not necessary to perform limited observations. By preparing a separate purchase order for each item of expense and by securing individual periodic time reports from the participants, one can gain an accurate cost picture. These documents can be kept in a file until the project completion and then compiled. Care must be taken to see that all the pertinent documents have been gathered.

Evaluation of Actual vs. Projected Cost Data

It is always ideal to have both projected and actual data to compare--especially for the evaluation of two or more alternative methods. By running the methods parallel and collecting costs from the same period of time and circumstances, close alternative comparisons are possible.

In other instances it may be too costly or time-consuming to run parallel methods, and a new decision must be made based upon projections. Whichever the case, the analysis or projected vs. actual costs is of great importance to determine both the causes and locations of differences.

Much can be learned about the adequacy of the planning process. The ability of the responsible party to make decisions which deviated from the plan is important and may affect the cost positively or adversely. Economic conditions may affect both labor and material costs similarly or in an inverse relationship. Finally, exemplary or shabby performance by the participants may distort costs from normal expectation and thus may lead one to draw incorrect conclusions when comparing two alternatives.

Maximizing on the Opportunity

Maximizing on the opportunity involves making an informed judgment on the data gathered and taking the action that the judgment dictates.

In the example cited, if the LEA's management fails to recognize that the human element of teacher participation is all-important, then regardless of the data implication, they probably will be unable to implement their divisions. Indeed, if the teachers are not an integral part of the reading package, both the evaluation and the data will be highly suspect.

Informed judgment involves analysis of the data. Projected vs. actual cost must be considered, and the reasons for variances must be weighed.

Evaluation criteria must be examined for real differences in level of achievement. Cost and evaluation should be combined to produce cost effectiveness comparisons.

There probably are as many different opinions about cost-effectiveness as there are problems to evaluate. The construct of the cost-effectiveness number remains an elusive concept because the elements vary with the elements of a problem to be studied and with the measure of effectiveness.

For example:

$$\frac{\text{Number of effectiveness units achieved}}{\text{Cost}} = \text{Cost per unit achieved}$$

$$\frac{\text{Number of effectiveness units achieved}}{\text{Number of effectiveness units possible}} = \text{\% of achievement}$$

$$\frac{\text{Cost}}{\text{\% of achievement}} = \text{Cost-Effectiveness Index}$$

It is necessary to relate cost to effectiveness but unit cost is not the answer. One could have a low unit cost by exerting little effort, but if his achievement were also low, then the effort could not be said to be cost-effective. Cost compared to the percentage of achievement is a unit cost, but it is the unit of overall effectiveness which managers are addressing. As such, the lower the cost-effectiveness index, the more desirable the outcome.

Evaluation of Reading Packages

	A	B	C
No. of students	10	12	15
No. of possible skills per student	14	12	12
No. of skills total	140	144	180
No. of skills achieved	131	120	150
Cost of package (include teacher)	\$500.	\$465.	\$432.
Cost per skill achieved	\$3.82	\$3.88	\$2.88
Measure of effectiveness	$\frac{131}{140}$	$\frac{120}{144}$	$\frac{150}{180}$
Percent effective	.93	.83	.83
Cost-effectiveness index	$\frac{500}{.93} =$	$\frac{465}{.83} =$	$\frac{432}{.83} =$
	538	560	520

In the example given, package A represents the highest percentage of achievement but at the highest cost. Package C is obviously a better choice than package B. The decision between package C and A is far more subtle and is a policy matter of whether it is worth the additional cost to attain the 10 percent differential in effectiveness.

It must be emphasized that common sense, intuition, and educational considerations will never be replaced by a pure statistical approach to decision-making.

Summary

The O-R Program Cost Model can be used for accountability purposes to develop expectations and to make comparisons against statewide data. Even more important, it could be used earlier in the program cycle to highlight management opportunities for cost savings and efficiency. However, a danger exists in that the parameters for such a model can easily become out of date. It will be necessary, therefore, to build the model so that it is not only predictive but self-analyzing in the data that it collects.

CHAPTER VII

ADAPTATION OF THE O-R PROGRAM COST MODEL TO THE SCHOOL BUILDING INSTRUCTIONAL LEVEL

Chapter Objectives

- To identify generalized components of school instructional programs
- To identify generalized components of the Maryland Instructional School Programs
- To identify the three basic dimensions of the cost model, noting modifications in the elements of the cost model
- To sketch the arrangement among educational goals, school building objectives, terminal classroom objectives, teaching and learning activities and tasks
- To identify the responsibilities of administrators, teachers, and students in the cost model
- To identify the essential structural elements within the "Instructional Plan Worksheet for Teachers"
- To identify the essential structural elements of the "Instructional Plan/Administrator Budget Worksheet for Administrators"
- To complete the two above-mentioned worksheets, using your own particular instructional programs

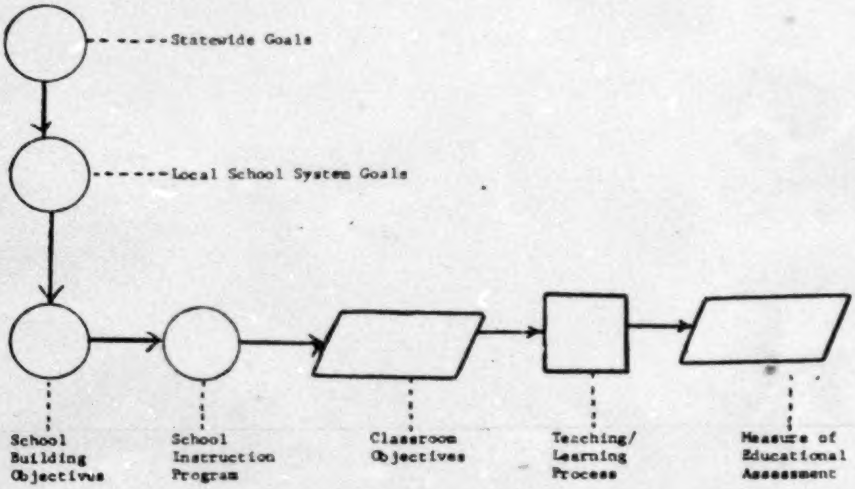
The modern school is an intricate institution. One of the primary responsibilities of the school administrator is the allocation of resources--money, manpower, materials, and services. Since the largest portion of his/her money goes for instructional purposes, school administrators ask, "How can I put an accurate price tag on the instructional process in school?" "How much will it cost to provide as comprehensive an instructional program as possible for students with available resources?" and "How do I get at the cost-effectiveness of instructional programs in my school?"

Chapter VII integrates instructional and cost structures.

Generalized Components of School Instructional Programs

Figure 7.1 illustrates a typical educational flow in the instructional process within the school structure.

Figure 7.1 Generalized Components of Statewide Instruction


Statewide Goals
Local School System Goals
School Building Objectives
School Instruction Program
Classroom Objectives
Teaching/ Learning Process
Measure of Educational Assessment

Within this component structure:

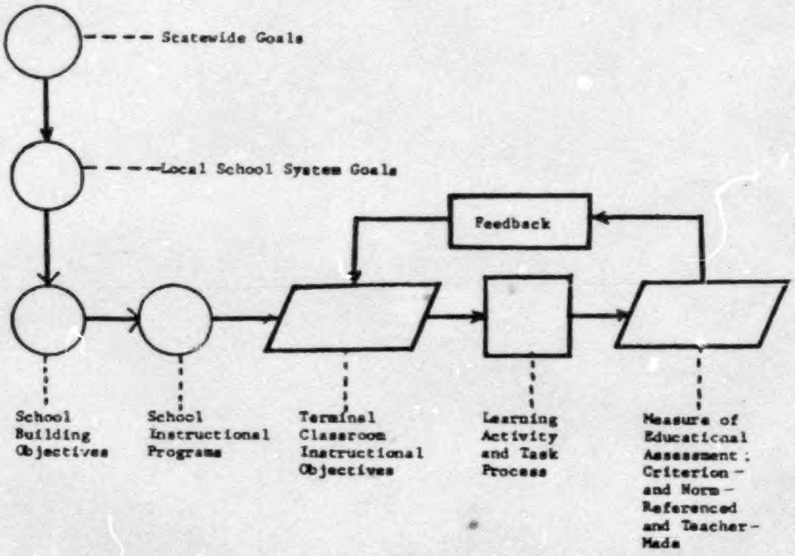
1. State legislatures mandate that state departments of education (SEA) identify the educational goals for a state.
2. Local school systems (LEA) can, if permitted, develop system-wide goals in compliance with state goals.
3. School building objectives (i.e., Administration, Instruction, Support Services) are identified.
4. School instructional programs are identified.
5. Classroom instructional objectives are formulated.
6. Educational teaching/learning processes are activated.

7. Student performance is assessed and school instructional programs are evaluated.

Generalized Components of Maryland Instructional School Programs

The generalized components of Maryland school instructional programs are based upon instructional theory, system structures, and practice. The program reflects an integration of concepts taken from instructional practices (e.g., Mastery Learning, Performance Objectives, Learning Structures, and Individualized Programming) and educational assessment (Criterion- and Objective-Referenced Measures). The typical arrangement of these generalized components is shown in Figure 7.2.

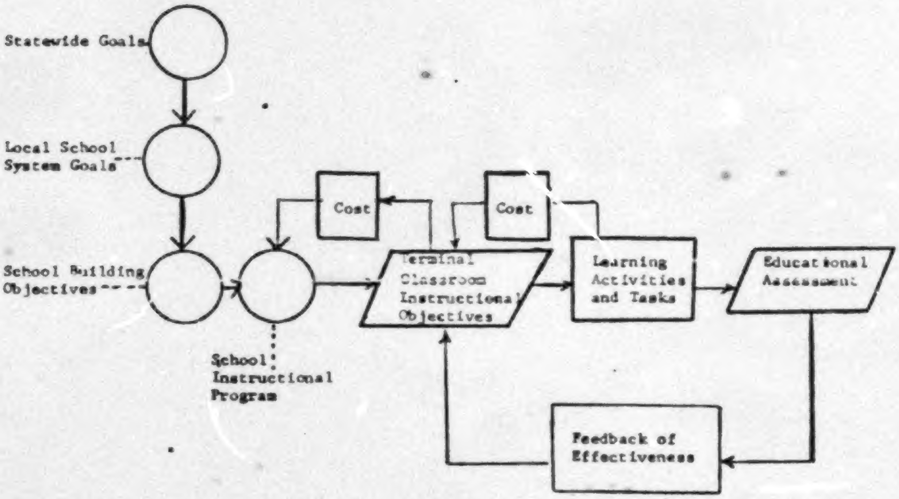
Figure 7.2 Generalized Components for Maryland Statewide Instruction


Statewide Goals
Local School System Goals
Feedback
School Building Objectives
School Instructional Programs
Terminal Classroom Instructional Objectives
Learning Activity and Task Process
Measure of Educational Assessment: Criterion- and Norm-Referenced and Teacher-Made

Cost Collection for Generalized Components for Maryland School Instructional Programs

Using the information provided in the previous section, one can add cost-related components and construct the model shown in Figure 7.3. This figure illustrates the level at which cost information is collected by school personnel.

Figure 7.3 Cost Collection Scheme for Generalized Components of Maryland School Instructional Programs


Statewide Goals
Local School System Goals
School Building Objectives
School Instructional Program
Cost
Cost
Terminal Classroom Instructional Objectives
Learning Activities and Tasks
Educational Assessment
Feedback of Effectiveness

In this illustration, one can describe the flow of educational process as follows:

1. State legislatures mandate and state departments of education (SEA) identify the educational goals for a state.

2. Local school systems (LEA) can, if permitted, develop system-wide goals in compliance with state goals.

3. The school building objectives at the administrative, instruction, and support services levels have been established.

4. Each school instructional program has been identified and defined.

5. Terminal classroom instructional objectives for each school program (K-12) have been delineated (by each teacher).[1]

6. Learning activities and tasks for each terminal and enabling objectives have been stated.

7. Costs (i.e., resources, materials, supplies, and equipment) have been determined for learning activities and tasks needed to accomplish the terminal objectives of the school profram.

8. A criterion measure has been built for each terminal objective. Such measures specify the kinds of learning tasks and information which the student will possess as evidence of mastering the objective.

9. Both the cost measure and the effectiveness measure are fed back to the terminal classroom instructional objectives which are, in turn, aggregated to the total school instructional program in order to provide an accurate picture of school instructional program cost and effectiveness.

In this school context the educational components of a school instructional program are planned, designed, implemented, and developed in concert with each other. This structure, in turn, becomes the framework from which instructional program costs can be drawn once the basic cost structure model is applied.

Cost Structure for School Instructional Programs: A Blueprint

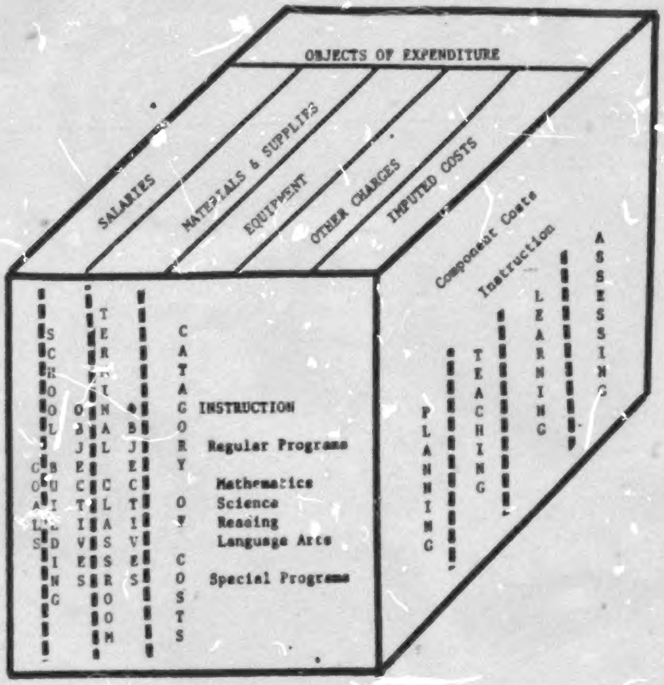
To the school instructional component cost structure, one can apply the basic dimensions of cost model discussed earlier in Chapter IV. For review, these dimensions are (1) Categories of Cost, (2) Object of Costs, and (3) Components of Costs. However, some internal modification is needed to accommodate the shift from the state and local levels to the school instructional program level. The essential changes lie (1) within the dimension identified as "Components of Cost," with the insertion of the elements of Planning, Teaching, Learning, and Student Assessment, and (2) in the front surface dimension (i.e., Category of Costs) in which the elements of Goals, School Building Objectives,

---

[1] The addition of the term "terminal" here refers to the evolution of instructional objectives from non-behavioral to behavioral or performance objectives, whereby objectives are stated in specific, concrete, and measurable terms.

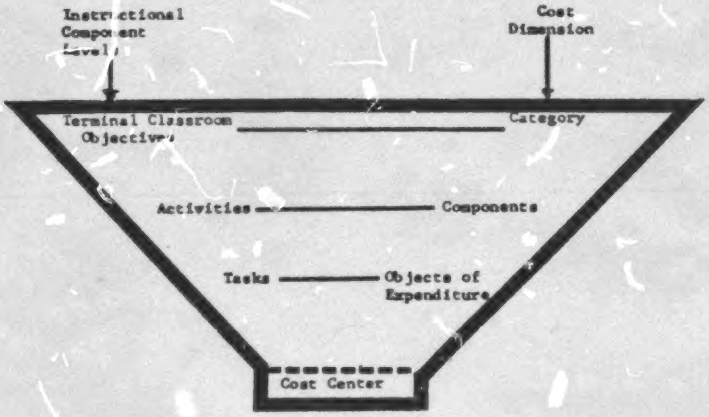
Terminal Classroom Objectives, and Category of Cost have been added. Figure 7.4 shows the three dimensional model with its internal modifications.

Figure 7.4 Modified Cost Model Dimensions


OBJECTS OF EXPENDITURE
SALARIES
MATERIALS & SUPPLIES
EQUIPMENT
OTHER CHARGES
IMPUTED COSTS
SCHOOL
BUILDING
GOALS
OBJECTIVES
TERMINAL
CLASSROOM
OBJECTIVES
CATAGORY OF COSTS
INSTRUCTION
Regular Programs
Mathematics
Science
Reading
Language Arts
Special Programs
Component Costs
Instruction
PLANNING
TEACHING
LEARNING
ASSESSING

Using the information illustrated in Figure 7.4 one can draw a flow chart (See Figure 7.5) of the cost model relation among terminal classroom objectives, activities, and tasks, i.e., Instructional Component Levels to category, components, and objects of expenditure (cost dimensions).

Figure 7.5 Flow of Cost Model Element Relation



As can be seen in the above figure, both the information on Cost Dimensions (as supplied by the administrator) and Instructional Components (as supplied by the teacher) are inserted into a single cost center. The following section discusses operationally the responsibilities of key school personnel that would enable this information to be placed in this cost center.

Teacher/Administrator Cost Center for the Objective-Referenced Model

The basic cost center for the school instructional program level is a teacher/administrator-oriented approach to program planning and budgeting. Both the teacher and the administrator contribute a valuable part to the implementation of this cost model. The following sections describe the role responsibilities of each part and the operational sequence required to implement this model. An instructional structure becomes the building block for attaching cost information which, in turn, becomes the means for attaching dollar figures to instructional programs.

Teacher's Role

One important assumption in working with teachers is that if a new "something" does not have any relevance to the children and day-to-day instruction in the classroom, that "something" will be doomed to failure. The age-old adage that educational programs should germinate at the grassroots level is one item program managers should keep in mind in developing, implementing, and costing out educational programs.

The proposed method of costing out educational programs about to be described had its origin in a course on educational accountability in the classroom taught at the University of Maryland. Seventy teachers from the Prince George's County school system designed, refined, and applied the teacher instructional plan shown in Figure 7.6. This plan reflects one mechansim among many improved methods in planning their classroom instruction.

Figure 7.6 Sample Teacher Instructional Plan Worksheet I

State Educational Goal (Specify Area):		
School System Goal		
School Building Terminal Objective (Instruction)		
Terminal Classroom Objectives:		
Assessment Measure for Objectives:		
Activity/Task Description	Dimension Description	Projected Resource, Materials, Equipment Needs Description
Activity Task Task Activity Task	Teach Learn Assess Evaluate	

The Instructional Plan Worksheet represents a systematic plan for teaching. The plan worksheet has two major functions. First, by completing all components of the plan sheet, the teacher (manager) can attend to all the crucial programmatic variables that can affect learning. Second, the plan sheet permits others to understand exactly what the student is expected to do, how the work is presented to students, and the teacher's (manager's) responsibilities for the program (i.e., teaching, learning dimensions, projected resources, materials and equipment needs, and assessment).

The plan sheet has eight major sections: State Educational Goals, Local School System Goals, School Building Objectives (i.e., management, instruction, or support), Terminal Classroom Objectives, Assessment Measure, Activity/Task, Dimension, and Projected Resources (i.e., materials and equipment needs). Each section must be completed fully if the plan worksheet is to be effective.

The first step taken by the teacher is to specify the following information:[2]

1. The State Educational Goal for a specific subject area (e.g., reading, mathematics, science)

2. The Local School System Goal in compliance with state goals (Note: This may be the same as the State Educational Goal)

3. The School Building Terminal Objective

These elements become the necessary framework from which the remaining classroom instructionally related elements are delineated. The latter elements include:

1. State terminal classroom instructional objectives

2. Stated learning activities and tasks

3. Stated dimension of instruction (e.g., teaching, learning, evaluating, assessing, etc.)

4. Stated resources, materials, and equipment needed to complete the objective(s)

5. Stated assessment measure(s) to determine if students have mastered the objective(s)

This instructional plan was shown by the class to be generalizable enough and (1) to have utility in wide ranges of subjects and industrial arts areas, (2) to become a source for the teacher to keep records of his/her own educational accountability, and (3) to become a springboard from which administrators could construct hands-on cost reporting forms.

For the costing of school instructional programs to occur, however, information from both teachers and administrators must be combined into a set of related forms. The next section discusses the role of the school administrator/finance officer and the set of cost-related forms needed to implement this objective-referenced costing system at the school instructional program level.

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[2] Where possible, however, these first three steps can be pre-printed at the school building level for the convenience of the teacher.

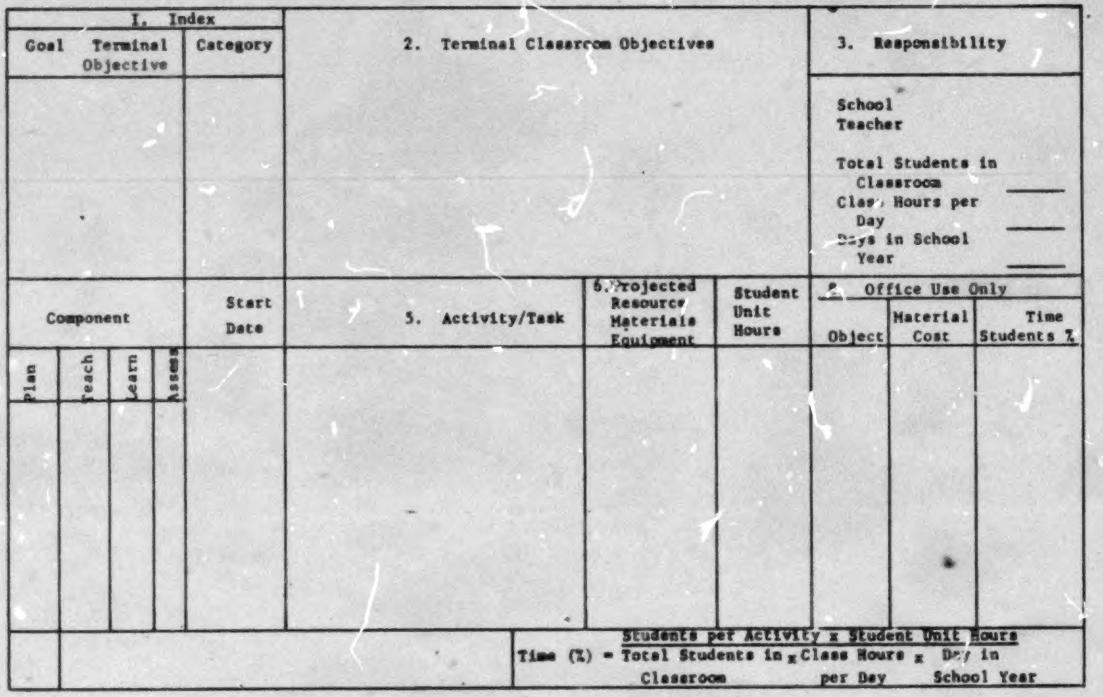
Administrator's Role

Using a teacher instructional plan as the base, the school administrator and/or finance officer can incorporate additional cost-related information into a set of consistent forms. Figures 7.7 and 7.8, labeled the "Plan Worksheet" and "Instructional Plan/Administrative Worksheet" respectively, are used by the school administrator to identify costs in educational instructional programs.

Figure 7.7 Plan Worksheet

Index			Mission Details		Component
Goal	Terminal Objective	Category			
			Goal		
			Terminal Objective		
			Activity Plan	Responsibility	Component

Figure 7.8 Instructional Plan/Administrative Budget Worksheet



<table>
<tr><td colspan="5">1. Index</td><td colspan="3" rowspan="2">2. Terminal Classroom Objectives</td><td colspan="3" rowspan="2">3. Responsibility</td></tr>
<tr><td colspan="4">Goal Terminal Objective</td><td>Category</td></tr>
<tr><td colspan="4"></td><td></td><td colspan="3"></td><td colspan="3">School
Teacher
Total Students in Classroom ____
Class Hours per Day ____
Days in School Year ____</td></tr>
<tr><td colspan="4" rowspan="2">Component</td><td rowspan="2">Start Date</td><td rowspan="2">5. Activity/Task</td><td rowspan="2">6. Projected Resource Materials Equipment</td><td rowspan="2">Student Unit Hours</td><td colspan="3">8. Office Use Only</td></tr>
<tr><td>Object</td><td>Material Cost</td><td>Time Students %</td></tr>
<tr><td>Plan</td><td>Teach</td><td>Learn</td><td>Assess</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td colspan="5"></td><td colspan="5">$$\text{Time (\%)} = \frac{\text{Students per Activity} \times \text{Student Unit Hours}}{\text{Total Students in Classroom} \times \text{Class Hours per Day} \times \text{Day in School Year}}$$</td></tr>
</table>

Plan Worksheet

The procedure for completing the "Administrator Plan Worksheet" is as follows:

Objective: Write the state or local goal, along with its related terminal classroom objectives and activities, and apply the index in coded form

Tasks: 1. Write the State or Local Goals for a subject area

2. Write Terminal Classroom Objective (i.e., the objective you want pupils to attain after completing a unit of study

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3. List each activity (and, when necessary, the tasks) for the Terminal Classroom Objective

4. Assign specific responsibility (to principal, teacher, counselor, finance officer, research unit) for that activity

5. Using the cost coding structure, code each activity as to goal, objective, category, and component

Figure 7.9 provides the administrator with a completed plan worksheet.

Figure 7.9 Plan Worksheet

Index					
Goal	Terminal Objective	Category	Mission Details		Component
01			Goal Children will decode the printed word into a meaningful symbol and acquire positive attitudes toward reading.		
01	01	Instruction 02	Terminal Objective By the end of the first quarter children will identify orally and by writing the letters of the alphabet as evidenced by completion of activity 6 and 7		
			Activity Plan	Responsibility	Component
01	01	02	1. Use regular alphabet books	teacher - student	Instru. 0700
01	01	02	2. Use tactile alphabet letters. Children should guess the letter with eyes closed.	teacher - student	0700
01	01	02	3. Develop experience charts daily with children	teacher - student	0700
01	01	02	4. Make individual alphabet books	student	0700
01	01	02	5. Match letters - upper and lower case	student	0700
01	01	02	6. Arrange selves (by name) in alphabetical order, while holding cards.	students	0800
01	01	02	7. Fill in missing letters in alphabetical sequence.	students	0800

It should be noted in this figure that the Goal, Terminal Classroom Objective, and Activity/Task constructs are the same as those found in the Teacher Instructional Plan Worksheet discussed earlier. Additional cost-related information (i.e., index, responsibility, and component) is supplied by the administrator. The next step is to complete the Instructional Plan/Administrative Budget Worksheet.

Instructional Plan/Administrative Budget Worksheet

The purpose of the Instructional Plan/Administrative Budget Worksheet is twofold:

1. To provide an instructional-diagnostic-prescriptive format to the teaching-learning process
2. To provide a costing component (i.e., administrator-oriented) to teaching-learning units

The instructions are designed ultimately to assist the school administrator to manage the distribution of funds to school instructional programs in an efficient manner. The principle underlying the instructions is that, by stating a terminal objective in a given school program with its accompanying tasks, the school administrator or school finance and accounting official can cost-out on an activity-by-activity, task-by-task, and assessment-by-assessment measure, the resources, materials, and equipment needed for that program over a given period of time (i.e., regular school year based on 180 days).

Figure 7.10 provides the school administrator or finance officer with a completed version of what is called the "Instructional Plan/Administrative Budget Worksheet."

Figure 7.10 Instructional Plan/Administrative Budget Worksheet

1. Index				
Goal	Terminal Objective	Category	2. Terminal Classroom Objectives	3. Responsibility
01	01	02	By the end of the first quarter children will identify orally and in writing the letters of the alphabet as evidenced by completion of activity 6 and 7.	School Name Teacher Total Students in Classroom 23 Class Hours per Day 5 Days in School Year 180

Component				Start Date	End Date	5. Activity/Task	6. Projected Resource Materials Equipment	Student Unit Hours	8. Office Use Only			
Plan	Teach	Learn	Assess						Object	Material Cost	Time Students	Time %
	720					1. Use regular alphabet books a. Teaching phonic sounds b. Teaching names of letters	Alphabet Book/ student	15	04	@ .90c $20.70	23	1.67
		730	740			2. Use tactile alphabet letters children should guess the letters with eyes closed	1 set letters/ five students	8	04	@ $6.00 $30.00	23	.89
	720	730				3. Develop experience charts daily with children	Chart paper crayons	6	03	@ $.50 $11.50	23	
		730				4. Make individual Alphabet books	---------------	5	03	-------	23	
		730	740			5. Match letters-upper & lower case	1 set alphabet card per student 6 + 1 pocket chart	6	03	@ 50c 11.50 @$3.00	23	
			740			6. Arrange clues (by name) in alphabetical order, while holding cards		4	04	$3.00		
			740			7. Fill in missing letters in alphabetical sequence	Dittos	6/total 150			23	5.56

$$\text{Time (\%)} = \frac{\text{Students per Activity} \times \text{Student Unit Hours}}{\text{Total Students in Classroom} \times \text{Class Hours per Day} \times \text{Day in School Year}}$$

Summary

The implementation of this integrated instructional and cost system offers both (1) teachers responsible for the learning objectives, activities, and tasks in the classroom and (2) school administrators responsible for the allocation of resources, an opportunity to review present systems and procedures for improvement in methods of executing day-to-day activities of school instructional programs. Implementation of such a system may be expected to provide the following benefits:

1. Increased efficiency
2. Improved internal control
3. Reduced school program redundancies
4. Increased comparability of data
5. Increased communication among educational personnel
6. Better trained personnel
7. Improved management reporting

CHAPTER VIII

SUMMARY

Chapter Objectives

- To identify the salient aspects of this study
- To relate accountability to the Objective-Referenced Program Cost Model

Chapter I presented the scope and purposes of the study, while Chapter II went on to describe the context of accountability from which the study had its origins.

Chapter III explored the trend in educational enterprise to use more sophisticated man-information management methodologies to resolve some of the pressing issues in school systems. Implied in the chapter was the theme that the development of ways to improve efficiency and avoid waste in education continues to be of paramount importance for today's administrators. Four major man-information management tools were discussed: (1) Program Planning and Budgeting Systems and its alternate forms; (2) Management by Objectives; (3) Management Information Systems; and (4) Uniform Accounting Procedures.

In Chapter IV, the blueprint of the "Objective-Referenced Program Cost Model for Educational Programs in Accountability" was presented. This model classifies the major elements of the school system structure (educational programs involved in accountability and costs in particular) with regard to their functions and interrelationships within the school system structure.

The Objective-Referenced Program Cost Model provides a systems structure for improving the delivery of educational outcomes. Such a model is useful for clarifying some portion of reality at the State, local, and school building levels, particularly: Accountability under what conditions? Accountability to whom? Accountability by whom? Accountability for what actions and outcomes? and Accountability to what degree and over what period of time and at what cost?

Specified behavioral or performance objectives are shown to minimize the failure to deliver on desired outcomes and thereby to optimize the relationship between available resources (i.e., human or fiscal) and the results obtained. The Objective-Referenced Program Cost Model provides more definitive information on what is expected from each division, unit, or individual in the educational enterprise and thereby provides the framework for more prudent and productive resource allocation.

Chapters V through VII applied the model to state departments of education, a local educational agency, and a school building level of the Maryland school system.

How, then, does one plan for the necessary resources to perform the task of being accountable? One begins by deciding what is necessary and desirable. If this is done in an objective manner and priorities are established, then the objective-referenced program cost model can be applied. Using the model, one can decide upon various levels of funding which will be necessary to function at various levels of being accountable. Objectives and activities can be trimmed or tailored to fit within the availability of funds, and alternatives can be selected. Thus, one determines the cost of the desired program, seeks funds to support that program, and alters the program to fit within those funds when they become available.

Having applied the model to one's accountability plan, one would find that the plan/budget and support service worksheets provide the necessary information for identification, analysis, and evaluation of cost of the specific objectives. Moreover, the evaluation of that objective which follows the model will be a measurement of the same set of activities and cost, thus paving the way to perform a cost-effectiveness judgment. This model performs the critical function of matching costs to performance. It has been the purpose of this publication to provide the framework for the development of budget, collection of costs, and fiscal evaluations of programs at the State, local, and school level.

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